

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE		PAGE OF PAGES	
2. AMENDMENT/MODIFICATION NO.		3. EFFECTIVE DATE		4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT NO. <i>(If applicable)</i>	
6. ISSUED BY		CODE		7. ADMINISTERED BY <i>(If other than Item 6)</i>		CODE	
8. NAME AND ADDRESS OF CONTRACTOR <i>(No., street, county, State and ZIP Code)</i>				(X)		9A. AMENDMENT OF SOLICITATION NO.	
						9B. DATED <i>(SEE ITEM 11)</i>	
						10A. MODIFICATION OF CONTRACT/ORDER NO.	
						10B. DATED <i>(SEE ITEM 11)</i>	
CODE		FACILITY CODE					

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers

☐ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

**13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS.
IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.**

CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: <i>(Specify authority)</i> THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES <i>(such as changes in paying office, appropriation date, etc.)</i> SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER <i>(Specify type of modification and authority)</i>

E. IMPORTANT: Contractor ☐ is not, ☐ is required to sign this document and return _____ copy to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER <i>(Type or print)</i>		16A. NAME AND TITLE OF CONTRACTING OFFICER <i>(Type or print)</i>	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
_____ <i>(Signature of person authorized to sign)</i>		_____ <i>(Signature of Contracting Officer)</i>	

Item 14. Continued.

CHANGES TO DOCUMENTS 00 - INTRODUCTORY, BIDDING, AND CONTRACT REQUIREMENTS

1. Project Table of Contents: Replace the project table of contents with the accompanying new table of contents bearing the notation "ACCOMPANYING AMENDMENT NO. 0002 TO SOLICITATION NO. W9126G-04-R-0046."

2. Section 00110 PROPOSAL SUBMISSION INSTRUCTIONS, EVALUATION AND BASIS OF AWARD: Replace Section 00110 with the accompanying new Section 00110, same title, bearing the notation "ACCOMPANYING AMENDMENT NO. 0002 TO SOLICITATION NO. W9126G-04-R-0046."

3. Section 00800 SPECIAL CONTRACT REQUIREMENTS: Replace Section 00800 with the accompanying new Section 00800, same title, bearing the notation "ACCOMPANYING AMENDMENT NO. 0002 TO SOLICITATION NO. W9126G-04-R-0046."

CHANGES TO THE SPECIFICATIONS

4. New Sections: Add the following accompanying new section bearing the notation "ACCOMPANYING AMENDMENT NO. 0002 TO SOLICITATION NO. W9126G-04-R-0046:"

01520 GOVERNMENT FIELD OFFICE

5. Replacement Sections: Replace the following Sections with the accompanying new sections of the same section number and title, each bearing the notation "ACCOMPANYING AMENDMENT NO. 0002 TO SOLICITATION NO. W9126G-04-R-0046:"

01010 GENERAL PROJECT DESCRIPTION AND DESIGN REQUIREMENTS
01016 DESIGN DOCUMENT REQUIREMENTS
01320F PROJECT SCHEDULE
01330 CONSTRUCTION SUBMITTAL PROCEDURES
01330 SUBMITTAL REGISTER
01421 BASIC STORM WATER POLLUTION PREVENTION PLAN
01451 CONTRACTOR QUALITY CONTROL
01525 SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS
13280A ASBESTOS ABATEMENT
13282N METALS ENCOUNTERED IN PAINT DUST DURING CONSTRUCTION
13284 REMOVAL, RECYCLING AND DISPOSAL OF REGULATED MATERIALS

6. Section 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD: At the end of this Section, after the attachment "Appendix F: Sample Backflow Prevention Assembly Test and Maintenance Report," add the accompanying new attachments "01368 Attachment 2" (Environmental Compliance Actions Checklist) and "01368 Attachment 3" (ENV Standard Operating Procedures), each bearing the notation "ACCOMPANYING AMENDMENT NO. 0002 TO SOLICITATION NO. W9126G-04-R-0046."

7. Section 13280A ASBESTOS ABATEMENT: Add the accompanying Attachments 13280A-Attachment 1 and 13280A-Attachment 2, each bearing the notation "ACCOMPANYING AMENDMENT NO. 0002 TO SOLICITATION NO. W9126G-04-R-0046," to the end of this Section.

CHANGES TO APPENDICES

8. Appendix B GEOTECHNICAL REPORT (PRELIMINARY): Replace Appendix B in its entirety with the accompanying new Appendix B bearing the notation "ACCOMPANYING AMENDMENT NO. 0002 TO SOLICITATION NO. W9126G-04-R-0046."

9. Appendix E ELECTRICAL REQUIREMENTS:

a. Attachment 4E PLAN, 16000 BLOCK: Replace this attachment 4E with the accompanying new attachment 4E entitled "PLAN, 16000 BLOCK".

b. Add the following new electrical attachments:

- Attachment 5E - SITE 11(TVM 41ST) & SITE 12 (TVM 37TH)
- Attachment 6E - SITE 13 (TVM 27TH)
- Attachment 7E - SITE 14 (TVM 25TH)
- Attachment 8E - SITE 15 (TVM16TH)
- Attachment 9E - SITE 2 (LZ PHANTOM)
- Attachment10E - SITES 3 (49000 BLK), 4 & 5(4900 BLK)
- Attachment 11E - SITE 6 (MOTOR POOL RD)
- Attachment 12E - SITE 10 (1900 BLK)
- Attachment 13E - SITE 24 (200/300 BLK)
- Attachment 14E - SITE 23 (800 BLK)
- Attachment 15E - SITES 21 & 22 (3500 BLK)
- Attachment 16E - SITE 30 (HAAF 700 BLK)
- Attachment 17E - SITE 1 (DOL AREA)
- Attachment 18E - SITES 25, 26, &27 (9500 BLK)
- Attachment 19E - SITE 20 (TANK DESTROYER & 78TH)
- Attachment 20E - 4600 BLDG AREA
- Attachment 21E - COMMUNICATIONS - SITES 3 (49000 BLK), 4 & 5(4900 BLK)
- Attachment 22E - COMMUNICATIONS - SITE 2 (LZ PHANTOM)
- Attachment 23E - COMMUNICATIONS - SITE 20 (TANK DESTROYER & 78TH)
- Attachment 24E - COMMUNICATIONS - SITES 21 & 22 (3500 BLK)
- Attachment 25E - COMMUNICATIONS - SITE 23 (800 BLK)
- Attachment 26E - COMMUNICATIONS - SITE 24 (200/300 BLK)
- Attachment 27E - COMMUNICATIONS - SITES 25, 26, &27 (9500 BLK)
- Attachment 28E - COMMUNICATIONS - SITES 8 (16000 BLK) & 9 (17000 BLK)
- Attachment 29E - COMMUNICATIONS - SITE 30 (HAAF AREA)
- Attachment 30E - COMMUNICATIONS - SITE 10 (1900 BLK)

10. Appendix F - Regulated Material Schedule: Replace Appendix F pages E-1, E-2, and E-3 with the accompanying new pages F-1, F-2, F-3, and F-4, each bearing the notation "ACCOMPANYING AMENDMENT NO. 0002 TO SOLICITATION NO. W9126G-04-R-0046."

11. Appendix K – Relocatable Facilities Functional Requirements.- Add the attached new Appendix K (k1 thru k15), each bearing the notation "ACCOMPANYING AMENDMENT NO. 0002 TO SOLICITATION NO. W9126G-04-R-0046."

CHANGES TO THE DRAWINGS

12. New Drawings.- The new drawings listed below which accompany this amendment, bearing the notation "AM #0002," shall be added to and become a part of the contract documents:

- G201 VOLUME ONE INDEX SHEET
- C-3 SITE 1 - DOL AREA SITE LOCATION
- C-5 SITE 3 - 49000 BLOCK SITE LOCATION
- C-8 SITE 6- MOTOR POOL ROAD SITE LOCATION
- C-11 SITE 10- 1900 BLOCK SITE LOCATION
- C-12 SITE 11- TVM SITE (AT BUILDING 15028)
- C-13 SITE 12- TVM SITE (AT BUILDING 13053)
- C-14 SITE 13- TVM SITE (AT BUILDING 17001)
- C-15 SITE 14- TVM SITE (AT BUILDING 9003)
- C-16 SITE 15- TVM SITE (AT BUILDING 15011)
- C-17 SITE 16- MURPHY LOOP PARKING SOUTH
- C-18 SITE 17- MURPHY LOOP PARKING NORTH
- C-21 SITE 20 - TANK DESTROYER ROAD AT 78TH ST. SITE
- C-22 SITE 21 - 3500 BLOCK SITE LOCATION (WEST)
- C-23 SITE 22 - 3500 BLOCK SITE LOCATION (EAST)
- C-24A SITE 23 - 800 BLOCK SITE LOCATION
- C-24B SITE 23 - 10000 BLOCK SITE LOCATION
- C-25 SITE 24 - 200/300 BLOCK SITE LOCATION
- C-26 SITE 25 - 9500 BLOCK SITE LOCATION (WEST)
- C-27 SITE 26 - 9500 BLOCK SITE LOCATION (CENTRAL)
- C-28 SITE 27 - 9500 BLOCK SITE LOCATION (EAST)
- C-29 SITE 28- MURPHY ROAD @ BLDG 728 SITE LOCATION
- C-30 SITE 29 - MURPHY ROAD @ BLDG 6978 SITE LOCATION
- C-31 SITE 30 - HAAF APRON EXPANSION
- TV-1 TRACKED VEHICLE MAINTENANCE STRUCTURE PLAN & ELEVATIONS
- TV-2 TRACKED VEHICLE MAINTENANCE STRUCTURE LIGHTS & POWER PLAN
- A101 DAYROOM FLOOR PLAN
- A102 COVERED STORAGE FLOOR PLAN
- A103 UNIT STORAGE FLOOR PLAN
- A104 VEHICLE MAINTANCE FACILITY FLOOR PLAN
- A105 ADMIN FACILITY FLOOR PLAN
- A106 CLASSROOM FLOOR PLAN
- A107 STORAGE FACILITY FLOOR PLAN
- A108 BARRACKS FLOOR PLAN
- A109 LAUNDRY FACILITY FLOOR PLAN
- A110 BATTALION HEADQUARTERS FLOOR PLAN
- A111 BRIGADE HEADQUARTERS FLOOR PLAN
- A112 COMPANY OPS FACILITY FLOOR PLAN
- A113 COMPANY OPERATIONS SUPPLY FACILITY FLOOR PLAN

13. Replacement Drawings.- Replace the drawings listed below with the attached new drawings(s) of the same number, bearing the notation "AM #0002":

Cover Sheet

- C-1 PROJECT LOCATION MAP 1 WEST
- C-2 PROJECT LOCATION MAP 2 EAST
- C-4 SITE 2 LZ PHANTON AREA REHAB HARDSTAND
- C-6 SITE 4 4920 BLOCK HARDSTAND OVERLAY
- C-7 SITE 5 4926 BLOCK HMSC OVERLAY
- C-9 SITE 8 16000 BLOCK BATTALION CLASSROOM
- C-10 SITE 9 17000 BLOCK UNIT STORAGE
- C-19 SITE 18 - 7000 BLOCK HMAC PVMT OVERLAY SOUTH
- C-20 SITE 19 - 7000 BLOCK HMAC PVMT OVERLAY NORTH
- CA-1 CONTRACTOR'S FIELD OFFICE LOCATION

END OF AMENDMENT

PROJECT TABLE OF CONTENTS

(AM #0002)

VOLUME I

(AM #0002)

CONTRACT REQUIREMENTS AND NEW CONSTRUCTION

DOCUMENTS 00 - INTRODUCTORY, BIDDING, AND CONTRACT REQUIREMENTS

00001 PROJECT TABLE OF CONTENTS
 00010A SOLICITATION, OFFER AND AWARD, SF-1442
 00010B PRICE PROPOSAL SCHEDULE
 00100 INSTRUCTIONS, CONDITIONS, AND NOTICES TO BIDDERS
 00105 OFFEROR'S CHECKLIST
00110 PROPOSAL SUBMISSION INSTRUCTIONS, EVALUATION AND BASIS OF AWARD AM#2
 00500 FORMS
 00600 REPRESENTATIONS AND CERTIFICATIONS
 00700 CONTRACT CLAUSES
 00710 WAGE RATES AND AFFIRMATIVE ACTION PLAN
 00800 SPECIAL CONTRACT REQUIREMENTS
 00800A APPENDIX A EXAMPLES OF EMBEDDED SYSTEMS

DIVISION 01 - GENERAL REQUIREMENTS

01000 DESIGN AND CONSTRUCTION SCHEDULE
 01010 GENERAL PROJECT DESCRIPTION AND DESIGN REQUIREMENTS
 01011 SPECIAL PROJECT REQUIREMENTS
 01012 DESIGN AFTER AWARD
 01016 DESIGN DOCUMENT REQUIREMENTS
 01310F PROJECT MEETINGS
 01312A QUALITY CONTROL SYSTEM (QCS)
 01320F PROJECT SCHEDULE
 01330 CONSTRUCTION SUBMITTAL PROCEDURES
 01340 COLOR/FINISH SAMPLE BOARDS
 01355 ENVIRONMENTAL PROTECTION
 01356A STORM WATER POLLUTION PREVENTION MEASURES
 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD
 01420 SOURCES FOR REFERENCE PUBLICATIONS
 01421 BASIC STORM WATER POLLUTION PREVENTION PLAN
 01421R SWPP PLAN INSPECTION AND MAINTENANCE REPORT FORM
 01430 DESIGN QUALITY CONTROL
 01451 CONTRACTOR QUALITY CONTROL
 01500 TEMPORARY CONSTRUCTION FACILITIES
 01525 SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS
 01561 DUST CONTROL
 01572A CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT
 01580 BULLETIN BOARD AND PROJECT SIGNS
 01670A RECYCLED / RECOVERED MATERIALS
 01720 SURVEY, LAYOUT, AND OTHER DATA
 01725 ALTERATIONS TO EXISTING FACILITIES
 01770F CONTRACT CLOSEOUT

DIVISION 02 - SITE CONSTRUCTION

02220 DEMOLITION
 02713A BITUMINOUS BASE COURSE
 02722A GRADED-CRUSHED AGGREGATE BASE COURSE
 02741A HOT-MIX ASPHALT (HMA) FOR ROADS
 02748A BITUMINOUS TACK AND PRIME COATS
 02754A CONCRETE PAVEMENTS FOR SMALL PROJECTS

DIVISION 13 - SPECIAL CONSTRUCTION

13280A ASBESTOS ABATEMENT
 13282N -METALS ENCOUNTERED IN PAINT DUST DURING CONSTRUCTION
 13284F REMOVAL, RECYCLING AND DISPOSAL OF REGULATED MATERIALS
 13805 ONE-WAY FREQUENCY MODULATION (FM) UTILITY MANAGEMENT & CONTROL
 SYSTEM (UMCS)DIGITAL CONTROL UNIT FT HOOD
 13815 AUTOMATED METER READING SYSTEM

APPENDICES

A **(AM#2) NOT USED**~~FACILITY FUNCTIONAL REQUIREMENTS (TO BE ADDED BY
 AMENDMENT)~~

B GEOTECHNICAL REPORT
 C FORT HOOD INSTALLATION DESIGN GUIDE
 D TECHNICAL SUPPLEMENT TO THE DESIGN GUIDE FOR FORT HOOD
 E ELECTRICAL REQUIREMENTS

1E SCENARIO #1 POP (POINT OF PRESENCE)MAIN
 TELECOMMUNICATIONS CLOSET
 2E 1114th SIGNAL BATTALION DIRECTORATE OF INFORMATION MANAGEMENT
 BUILDING COMMUNICATIONS WIRING STANDARD
 3E PLAN, 17000 BLOCK
 4E PLAN, 16000 BLOCK
 (AM#2) 5E SITE 11(TVM 41ST) & SITE 12 (TVM 37TH)
 (AM#2) 6E SITE 13 (TVM 27TH)
 (AM#2) 7E SITE 14 (TVM 25TH)
 (AM#2) 8E SITE 15 (TVM16TH)
 (AM#2) 9E SITE 2 (LZ PHANTOM)
 (AM#2) 10E SITES 3 (49000 BLK), 4 & 5(4900 BLK)
 (AM#2) 11E SITE 6 (MOTOR POOL RD)
 (AM#2) 12E SITE 10 (1900 BLK)
 (AM#2) 13E SITE 24 (200/300 BLK)
 (AM#2) 14E SITE 23 (800 BLK)
 (AM#2) 15E SITES 21 & 22 (3500 BLK)
 (AM#2) 16E SITE 30 (HAAF 700 BLK)
 (AM#2) 17E SITE 1 (DOL AREA)
 (AM#2) 18E SITES 25, 26, &27 (9500 BLK)
 (AM#2) 19E SITE 20 (TANK DESTROYER & 78TH)
 (AM#2) 20E 4600 BLDG AREA
 (AM#2) 21E COMMUNICATIONS - SITES 3 (49000 BLK), 4 & 5(4900 BLK)
 (AM#2) 22E COMMUNICATIONS - SITE 2 (LZ PHANTOM)
 (AM#2) 23E COMMUNICATIONS - SITE 20 (TANK DESTROYER & 78TH)
 (AM#2) 24E COMMUNICATIONS - SITES 21 & 22 (3500 BLK)
 (AM#2) 25E COMMUNICATIONS - SITE 23 (800 BLK)
 (AM#2) 26E COMMUNICATIONS - SITE 24 (200/300 BLK)
 (AM#2) 27E COMMUNICATIONS - SITES 25, 26, &27 (9500 BLK)
 (AM#2) 28E COMMUNICATIONS - SITES 8 (16000 BLK) & 9 (17000 BLK)
 (AM#2) 29E COMMUNICATIONS - SITE 30 (HAAF AREA)
 (AM#2) 30E COMMUNICATIONS - SITE 10 (1900 BLK)

F REGULATED MATERIALS SCHEDULE
G SAMPLE OF A READY FOR OCCUPANCY CHECKLIST
H SWD ARCHITECTURAL AND ENGINEERING INSTRUCTIONS MANUAL (AEIM)
I DD FORM 1354 AND SAMPLE
J DRAWINGS

K RELOCATABLE FACILITIES FUNCTIONAL REQUIREMENTS (AM#2)

K1	<u>ADMINISTRATION FACILITIES</u>
K2	<u>ARMS ROOM</u>
K3	<u>BARRACKS</u>
K4	<u>BATTALION HEADQUARTERS</u>
K5	<u>BRIGADE HEADQUARTERS</u>
K6	<u>CLASSROOM</u>
K7	<u>COMPANY OPERATIONS</u>
K8	<u>COMPANY OPERATIONS SUPPLY BUILDING</u>
K9	<u>COVERED STORAGE</u>
K10	<u>DAYROOM</u>
K11	<u>LAUNDRY</u>
K12	<u>STORAGE BUILDING</u>
K13	<u>TACTICAL VEHICLE MAINTENANCE (TVM)</u>
K14	<u>UNIT STORAGE BUILDING</u>
K15	<u>VEHICLE MAINTENANCE</u>

(AM #0002) VOLUME II RENOVATIONS

(WILL BE ADDED BY AMENDMENT NO. 0004)

-- End of Project Table of Contents --

SECTION 00110

PROPOSAL SUBMISSION INSTRUCTIONS, EVALUATION AND BASIS OF AWARD

1. PROPOSAL OVERVIEW. This Request for Proposal (RFP) solicits **Design-Build Miscellaneous Construction, Renovation, & Alternation Projects for the 4th ID Deployment Facilities**. In as much as the proposal shall describe the capability of the Offeror to perform any resulting contract, the proposal should be specific and complete in every detail. The proposal should be prepared simply and economically, providing a straightforward and concise description of capabilities to satisfactorily perform the contract. The proposal should be practical, legible, clear, and coherent. Local Instructions, including Federal Acquisition Regulation (FAR) Provisions are annotated at the end of this section.

1.1 Proposal Submissions and the Trade-Off Process. This process permits tradeoffs among cost or price and non-cost factors and allows the Government to accept other than the lowest priced proposal. Offerors submit their performance and capability information for review and consideration by the Government. Relative weights among technical factors are provided in paragraph 5 Evaluation Factors and Weights.

2. PROPOSAL SUBMISSION INSTRUCTIONS

2.1 Who May Submit. Any legally organized Offeror may submit a proposal.

2.2 Where to Submit. Offerors shall submit their proposals to the Fort Worth District at the address shown in Block 7 of the Standard Form 1442.

2.3 Submission Deadline. Proposals shall be received by the Fort Worth District no later than the time and date specified in Block 13 of Standard Form 1442.

2.4 General Requirements.

2.4.1 In order to effectively and equitably evaluate all proposals, the Contracting Officer must receive information containing sufficient detail to allow review and evaluation by the Government. Proposal clarity, organization, and cross-referencing are mandatory. Failures to submit and organize proposals as requested may adversely affect an Offeror's evaluation. Offerors should provide sufficient detail and clearly define all items required in this section. The Contracting Officer may remove any Offeror from further consideration during any phase of the procurement if the Offeror fails to meet the submittal requirements of the RFP or to reduce the competitive range for purposes of efficiency pursuant to FAR 15.306(c)(2).

2.4.2 Tabs. Proposal shall be organized and tabbed as shown in paragraph 2.5 Submission Format.

2.4.3 Size of Printed Matter Submissions.

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2.4.3.1 Written proposal materials shall be submitted in standard three ring loose-leaf binders. Proposals shall be tabbed and labeled in a manner to afford easy identification from a Table of Contents. Font size shall not be less than 10 point. Each page shall be identified with the appropriate page number centered at the bottom of the page. Sheet size of the proposal contents shall be 8-1/2 inches x 11 inches where sheets are prepared specifically for this proposal; however, if drawings, charts, or other graphics are submitted, sheets no larger than 11 inches x 17 inches and folded to 8-1/2 inches x 11 inches shall be used. 11 x 17 inch sheets will be counted as 4 single-sided or 2 double-sized pages. Volume II, Technical Proposal, shall not exceed (Am 0002) 70 pages (70 single sided or 35 double sided sheets) ~~50 pages (50 single sided or 25 double sided sheets)~~, excluding the Table of Contents. The Offeror shall not submit verbatim sections of this solicitation as part of their proposal. Offers that do not meet these requirements may be subject to rejection.

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**Design/Build Miscellaneous Construction,
Renovation, & Alternation Projects
Fort Hood, Texas**

2.4.3.2 The proposals shall contain a detailed table of contents. If more than one binder is used, the complete table of contents shall be included in each. A cover sheet identifying the Offeror (name, address, point of contact) project description, and solicitation number shall be provided. The second sheet shall be a Table of Contents. Offers that do not comply with this RFP requirement unnecessarily delay the evaluation process and may be rejected by the Government after the initial evaluation without receiving any further consideration. The Government shall not be obligated to evaluate any information beyond the page limitation noted above.

2.4.3.3 Proposal revisions shall be submitted as page replacements with revised text readily identifiable, e.g., bold face print or underlining. The source of the revision, e.g., Error, Omission, or Clarification, or amendment shall also be annotated for each revision. Proposal replacement pages shall be numbered, shall be clearly marked "REVISED", shall show the date of revision, shall be submitted in appropriate number of copies (e.g., if two (2) copies of the original page was required, then two (2) copies of the revised page will also be required, and shall be a different color than the original pages they are to replace.

2.4.4 Number of Copies. Offerors shall submit an original and one (1) hard copy of Volume I and an original and ten (10) hard copies of Volume II of their Proposal. Within three (3) days of contract award, the awardee shall submit both volumes in electronic format on a CD-ROM.

2.5 Submission Format.

2.5.1 The Proposal will be tabbed and submitted in a three ring binders in the following format:

VOLUME I PRO FORMA

TAB A – SF 1442, completed and signed by an authorized person from the company or team

TAB B – Section 00010 – Supplies or Services and Price/Costs Schedule

TAB C – Section 00600 – Representations and Certifications

TAB D – PROPOSAL DATA SHEET – See the format provided in this Section. Ensure to include Offeror's telephone number, FAX number, e-mail address and DUNS and CAGE code numbers. Duns number will be used to access CCASS data.

TAB E – Bid Bond (Standard Form 24)

TAB F – Pre Award Information (e.g. Bank and Supplier References)

In accordance with FAR 9.103(a) "... contracts shall be awarded to responsible prospective contractors only." To be determined responsible, a prospective contractor must meet the standards at FAR 9.104 that requires a prospective contractor to have adequate financial resources to perform the contract or the ability to obtain them. As an aid in assessing responsibility, the offeror shall notify their bank/suppliers that the Corps of Engineers may contact them, and shall authorize the bank/suppliers to release the following information regarding the Offeror's account. If a written authorization is required by their bank, Offerors shall provide that authorization with their proposal.

Name and telephone number of bank's point of contact

Number of year's business has been conducted with each bank

Types of open accounts (checking, loans, etc.)

Balance of current accounts (the banks will provide a "range of figures" for this information, such as, medium five-figures range)

Means by which loans are secured and if paid as agreed

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**Design/Build Miscellaneous Construction,
Renovation, & Alternation Projects
Fort Hood, Texas**

Point of contact and telephone number of three (3) different suppliers

For the purpose of evaluating the preaward survey information submitted hereunder:

Preaward survey data will be evaluated and rated as it relates to the probability of the offeror successfully accomplishing the proposed effort.

The Government will use pre-award survey data provided by the offeror and data obtained from other sources to perform this assessment.

TAB G – Subcontracting Plan – FOR LARGE BUSINESS OFFERORS ONLY

All large businesses shall submit a subcontracting plan with their price/cost proposal (Volume I). The plan shall be prepared in accordance with FAR 52.219-9. Failure to submit an acceptable subcontracting plan may make the offeror ineligible for award of the contract. The submission of the subcontracting plan is in no way advantageous to large businesses over any small business in the evaluation process. A sample AFARS Appendix DD scoring checklist is included at the end of Section 00100. See the this Section 00100, subsection Local Instructions, paragraph SMALL BUSINESS SUBCONTRACTING PLAN for additional information and Fort Worth District subcontracting floors.

VOLUME II – Technical Proposal

Am 0002

THE TECHNICAL PROPOSAL SHALL NOT INCLUDE ANY COST INFORMATION AND SHALL NOT EXCEED (Am 0002) 70 ~~50~~ PAGES (AS ANNOTATED ABOVE).

TAB 1 – FACTOR 1: DESIGN & CONSTRUCTION PAST PERFORMANCE (Worksheet Provided)

TAB 2 – FACTOR 2: CORPORATE RELEVANT SPECIALIZED EXPERIENCE (Worksheet Provided)

TAB 3 – FACTOR 3: MANAGEMENT EFFECTIVENESS (No Worksheet Provided)

TAB 4 – FACTOR 4: PROJECT DURATION (No Worksheet Provided)

3. TECHNICAL PROPOSAL SUBMISSION REQUIREMENTS.

3.1 FACTOR 1: DESIGN & CONSTRUCTION PAST PERFORMANCE (VOLUME II, TAB 1).

PAST PERFORMANCE (DESIGN & CONSTRUCTION) consists of two subfactors: Past Performance and Health and Safety Record. Past performance of the offeror, subcontractors, consultants, and key individuals will be considered in evaluating past performance, utilizing information provided in the proposal and other information available to the Contracting Officer, including but not limited to the following: The following will be considered in descending order of importance:

a) PAST PERFORMANCE

Offerors shall be evaluated on construction projects completed in the last five years. The Offeror's past performance will be evaluated to determine technical capability to perform the proposed contract and how well it satisfied its customers. The information presented in the Offeror's proposal that from other sources available to the Government will comprise the input for evaluation of this factor. The following elements will be evaluated:

- Quality of Construction
- Timeliness of Performance
- Customer Satisfaction
- Subcontractor Management

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**Design/Build Miscellaneous Construction,
Renovation, & Alternation Projects
Fort Hood, Texas**

- Documentation
- Safety Record

- 1) For each design and/or construction firm on the project team, provide the firm's name, address, and DUNS number.
- 2) ACASS (A-E Contract Administration Support System) and CCASS (Construction Contract Administration Support System) Evaluations. ACASS evaluations will be utilized in evaluating the past and current performance on Corps of Engineers contracts for Architect-Engineering firms on the offeror's Design-Build team. CCASS evaluations will be utilized to evaluate past and current performance on Corps of Engineers contracts for construction firms on the offeror's Design-Build team.
- 3) Federal Agency Performance Evaluations
- 4) Contractor Performance Report From State and local governments and private sector clients. Submitted Contractor Performance Reports may be verified telephonically. References not supported by a Contractor Performance Report may be contacted in writing or telephonically to assess customer satisfaction.
- 5) Awards, letters, and other forms of recognition

All other information available to the Government Provide the Architect-Engineer Contract Administration Support System (ACASS) or Construction Contractor Appraisal Support System (CCASS) Performance Evaluations you received on DOD Government design projects. Copies of records contained in the Corps of Engineers ACASS and CCASS Database may be requested by fax on company letterhead at the following telefax number: (503) 808-4596.

New Companies: For new companies entering the marketplace (without relevant company experience) the quality of the past performance of their key management personnel of the Primary Design Construction Team and consultants will indicate the risk of good performance and become the basis of the past performance evaluation. Identifying how long key personnel stayed on their contracts and how well they managed their portion of the referenced contracts will be of great importance in the evaluation process.

b) HEALTH AND SAFETY RECORD

The Offeror shall submit OSHA Form 300 **containing the Offeror's health and safety records for the previous five years.** This form, in Microsoft Excel format, can be downloaded from the Internet at the address:

http://www.ehso.com/OSHA_Forms.htm

Using the data and the following formula, calculate the Incident Rate for each of the five years:

$$\frac{\text{Number of Lost Time Accidents for the year} \times 200,000}{\text{Man-hours Worked that Year}} = \text{Incident Rate for the Year}$$

Submit these incident rates with the OSHA Form 300 data.

NOTE: If the Offeror already has copies of the old OSHA Form 200, the data may be submitted on this form in lieu of on OSHA Form 300.

3.1.1 Offeror's Submission Requirements.

- 3.1.1.1 **Past Performance Information Sheets.** Offerors shall complete and provide Past Performance Information on no more than 5 projects that reflect prior experience in the design & construction elements referenced in paragraph 3.1 above. The examples should be similar to this solicitation in project type and scope.

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As a minimum, the contractor shall provide the data specified in the “**Design & Construction Past Performance Information**” Sheet. For each project submitted, offerors are encouraged to attach the following supporting documentation to the design & construction past performance information sheet, ensuring that you do not exceed the proposal **(Am 0002) 70** ~~50~~-page limitation:

- For Corps of Engineer contracts, provide a copy of the signed CCASS (Construction Contract Administration Support System) and ACASS (A-E Contract Administration Support System) evaluation issued at the completion of the project.
- For non-Corps of Engineer contracts, provide a copy of the performance rating issued by the contracting agent.
- Awards, letters or other forms of recognition relevant to the submitted project that demonstrate the offeror’s performance capabilities and customer satisfaction.

3.1.1.2 Safety Record. The offeror shall submit OSHA Form 300A (summary), OSHA 200 or OSHA 300 showing the incident rates for their firm for all projects within the past five years. This form, in Microsoft Excel format, can be downloaded from the Internet at:

<http://www.ehso.com/osha200form-all-in-1.pdf>

<http://www.cbs.state.or.us/external/osha/standards/docs/osha300a.doc>

<http://www.osha.gov/recordkeeping/new-osha300form1-1-04.xls>

http://www.nccrimecontrol.org/HR/OSHA_Form_300.doc

http://www.dir.ca.gov/dosh/dosh_publications/oshalog300.pdf

This data is to be converted using the following formula for each of the five years:

$$\frac{\text{Number of Lost Time Accidents for the year} \times 200,000}{\text{Man-Hours Worked that Year}} = \text{Incident Rate for the Year}$$

The contractor, for each of the past 5 years using the OSHA Form 200 or 300 data, shall calculate these incident rates. These calculations shall be presented on a separate sheet of paper for each year with the mathematical average of all 5 years.

If the Offeror has a safety incentives program, information shall be submitted describing this program. The description of the safety incentives program shall include as a minimum a description of what benefits the firm has seen by implementing the program, benefits to the customer and a description of how the program is administered.

3.1.1.3 Other Sources. The Government may contact sources other than those provided by the Offeror for information with respect to past performance. These other sources may include, but are not limited to, CCASS, ACASS, telephone interviews with organizations familiar with the Offeror’s performance, and Government personnel with personal knowledge of the Offeror’s performance capability.

3.1.1.4 New Companies and Joint Ventures. For new companies and joint ventures entering the marketplace (without relevant company experience), the quality of the past performance of their key management personnel will indicate the risk of good performance and become the basis of the past performance evaluation. Identifying how long key personnel stayed on their assigned projects and how well they managed their portion of the referenced projects will be of great importance in the evaluation process.

3.1.2 Evaluation. The Government will evaluate the Offeror's responsiveness to the solicitation regarding past performance using the sources identified above. New Companies and Joint Ventures shall be evaluated on their own past performance to determine the company's ability to perform satisfactorily under the elements of evaluation.

Offerors may be provided an opportunity to address any negative past performance information about which the Offeror has not previously had an opportunity to respond. The Government treats an Offeror's lack of past performance as having no positive or negative evaluation significance. The Government will evaluate past performance based on the elements listed below:

- **Quality of Design & Construction.** Based on all information available, the Government will assess the quality of the actual design & onstruction undertaken and the standards of workmanship exhibited by the Offeror.
- **Timeliness of Performance.** The Government will evaluate all information available with respect to the Offeror completing past projects within the scheduled completion times.
- **Customer Satisfaction.** The Government will evaluate all information available with respect to the Offeror's past customer satisfaction, cooperation with customers, and interaction on past projects.
- **Subcontractor Management.** The Government will evaluate all information available with respect to the Offeror's management of subcontractors, including mitigation of conflicts and resolution of disputes at the lowest level. For large businesses, the Government will also evaluate compliance with subcontracting plans.
- **Documentation.** The Government will evaluate all information available with respect to the Offeror's level of meeting customer satisfaction on timeliness and quality of the documentation, reports, and other written materials completed by the Offeror on past projects.
- **Safety Record.** Offerors who have minimal health and safety incident rates and a documented safety incentive program will receive a more favorable evaluation. Offerors who have incident rates averaging below 0.84 for the past 5 years will be rated Average or better. Offerors who have incident rates averaging between 0.84 and 1.95 for the past 5 years will be rated as Poor. Offerors who have incident rates averaging over 1.95 for the past 5 years will be rated Unacceptable.

3.2 FACTOR 2: CORPORATE RELEVANT SPECIALIZED EXPERIENCE (VOLUME II, TAB 2).

Offerors shall be evaluated on design & construction projects successfully completed or in progress in the last five years that demonstrate the Offeror's specialized experience in the design & construction of similar design & construction projects. For this proposal, similar projects are projects that meet the following criteria:

Furnish detailed examples of Offeror's experience in the performance of similar type work to that required by the contract, both for Government agencies and private industry. Examples shall show relationship of experience to the design & construction services required by the Technical Specifications, and length of experience for each similar service. Offeror's examples shall all be within the last 5 years. **Offeror's proposed subcontracting plan shall be discussed, detailing types of construction to be subcontracted.**

3.2.1 Offeror's Submission Requirements. Offerors shall submit project information for no more than five completed or in progress design & construction projects that reflect specialized experience in the design & construction elements referenced in paragraph 3.2 above. The examples should be similar to this solicitation in project type and scope. As a minimum, the contractor shall provide the data specified in the **attached "Corporate Relevant Specialized Experience" Sheet**. If the Offeror represents the combining of two or more companies for the purpose of this RFP, each company shall list project examples. Example projects must be in progress, or have

been completed not more than five (5) years prior to the date of the solicitation. The experience of individuals will not be credited under this factor.

EXPERIENCE (DESIGN & CONSTRUCTION) consists of two sub-factors: Design Experience and Construction Experience. List no more than 5 projects total for both subfactors. Each project example shall include:

- a. Project name and location
- b. Type of facility
- c. Identify type of contract (design, design/build, or construction)
- d. Description of the project and the area of experience the project demonstrates
- e. Construction contract award amount (estimated or actual);
- f. Final construction cost (or most current cost if NOT complete);
- g. Date when the project was started;
- h. Original scheduled contract finish date
- i. Actual finish date (or estimated finish date if not complete)
- j. Overall size of facility (in square feet)
- k. Construction cost (excluding design costs)
- l. Duration of construction (excluding design time)
- m. Problems encountered and corrective actions taken
- n. Identify which proposed team members and/or firms were involved in the project; their specific roles and responsibilities on the project; and the extent of time they were involved with the project
- o. Relevance of experience to the solicitation project
- p. Was sustainable design used? If yes, indicate the certification level.
- q. If a government contract, include the contracting agency and contracting officer's name, telephone number, fax number, and email address (if known)
- r. All examples shall also contain the name, address, telephone and fax number of a representative of the customer (as well as one alternate individual affiliated with your firm) familiar with the Offeror's experience on the project that can verify the experience cited.

a) DESIGN EXPERIENCE

Provide a list of projects currently underway or completed preferably within the last 5 years that best demonstrates the design experience of the design team (firms and/or individual team members) to successfully complete this facility using a design/build process. Experience beyond 5 years ago for design firms will be given less consideration than more recent experience. Projects shall indicate experience in one or more of the following categories:

- 1) Experience on Similar Projects
Similar Projects include Phased Construction and Demolition and where the projects have a dollar value greater than \$25 million.
- 2) Design-Build Experience
- 3) Military Construction Design Experience
Military Construction design experience is considered to be experience on those projects constructed on and for military installations but may include projects for other Federal, State, or Local Government agencies.

The Offeror must clearly identify for which experience area(s) each project example pertains (e.g., Project A may qualify and be listed for similar projects, design-build, and military construction while Project B may qualify and be listed only for similar projects; etc.).

b) CONSTRUCTION EXPERIENCE

Provide a list of projects currently underway or completed preferably within the last 5 years that best demonstrates the construction experience of the construction team (firms and/or individual team members) to successfully complete this facility using a design/build process. An offeror must make clear the extent of involvement in those projects by current key personnel and clearly describe how the older project is similar to this project, considering changes in technology, materials, equipment, codes, etc. Projects shall indicate experience in one or more of the following categories:

- 1) Experience on Similar Projects
Similar Projects include phased construction and demolition and where the projects have a dollar value greater than \$25 million.
- 2) Design-Build Experience
- 3) Military Construction Experience
Military Construction experience is considered to be experience on those projects constructed on and for military installations but may include projects for other Federal, State, or Local Government agencies.
- 4) Experience at Fort Hood , Texas

The Offeror must clearly identify for which experience area(s) each project example pertains (e.g., Project A may qualify and be listed for similar projects, design-build, military construction, and experience at Fort Hood, Texas while Project B may qualify and be listed only for similar projects; etc.).

3.2.2 New Companies and Joint Ventures. If offeror represents the combining of two or more companies for the purpose of this RFP, the proposal shall clearly identify the contractual responsibilities of each firm and the work to be performed by each; describe the nature of the association; indicate whether the firms have experience working together in design & construction ventures, including how long and how many projects. In addition, each company including joint ventures shall list their Government contract experience. Provide a copy of the commitment letter of the firms or the joint venture agreement. Prior to award of any contract, a copy of the Joint Venture Agreement will be required. If approval of the Joint Venture Agreement is required by the Small Business Administration, failure to timely provide an approved SBA Joint Venture Agreement may prevent award of a contract.

3.2.3 Evaluation. The Government will review the example design & construction projects provided by the Offeror to evaluate and rate the recent relevant specialized experience of the Offeror with similar projects. The example design & construction projects should closely resemble the scope, size, and complexity of the project identified in this solicitation. **The Government will place a higher value on experience with similar projects executed with the Corps of Engineers or other DoD Components and for experience at Fort Hood, Texas.** If the Offeror cannot provide suitable relevant experience and the evaluators consider that the information provided indicates that the Offeror has no relevant experience, a determination will be made as to the risk this lack of corporate experience presents to the Government and the proposal will be evaluated accordingly.

EXPERIENCE (DESIGN & CONSTRUCTION) contains two subfactors that approximately equal: Design Experience and Construction Experience. Experience of primary teaming partners will be recognized and evaluated in the same manner as Experience of the Offeror. EXPERIENCE (DESIGN & CONSTRUCTION) will be evaluated as follows:

a) DESIGN EXPERIENCE

The offeror will be evaluated based on the recent experiences of the design team (firms and/or individual team members). The amount of consideration will depend upon the extent of the offeror's experience, similarity between previous project scopes of work and this project, and the relevance of the offeror's experience to this

project. Experience in the following areas will be considered, in descending order of importance: Offerors may be evaluated more favorably where there is experience in more than one of the areas.

(1) Similar Projects: A proposal offering Similar Project experience through project examples under the prescribed parameters of this solicitation may be evaluated more favorably than those, which demonstrate the experience in the other areas. Offerors may be evaluated more favorably based on: (i) a larger number of similar projects; (ii) more recent projects; or (iii) projects with a dollar value over \$25 million.

(2) Design-Build: No previous design-build team experience is necessary to qualify for award of this project; however, consideration will be given for recent, successful D-B team experience between the construction firm and design firms(s).

(3) Military Construction Design: Familiarity with federal regulations and administration of Corps of Engineers or other federal contracts are considered relevant. Corps of Engineer projects are considered more relevant than those of other Federal agencies, state, or local experience. Corps of Engineers projects at Fort Hood, Texas than Corps of Engineer Projects at other Military Installations.

(4) Previous Experience As A Team. Extent to which members of the proposed team have worked together on previous projects as a team will be considered. Design team experience, construction team experience, and design-construction team are all considered relevant. experience

(5) Sustainable design. Consideration will be given to ther use of sustainable design.

b) CONSTRUCTION EXPERIENCE

The offeror will be evaluated based on the recent experiences of the construction team (firms and/or individual team members). The amount of consideration will depend upon the extent of the offeror's experience, similarity between previous project scopes of work and this project, and the relevance of the offeror's experience to this project. Experience in the following areas will be considered, in descending order of importance. Offerors may be evaluated more favorably where there is experience in more than one of the areas.

1) Similar Projects: A proposal offering Similar Project experience through project examples under the prescribed parameters of this solicitation may be evaluated more favorably than those, which demonstrate the experience in the other areas. Offerors may be evaluated more favorably based on: (i) a larger number of similar projects; (ii) more recent projects; or (iii) projects with a dollar value over \$25 million.

2) Design-Build: No previous design-build team experience is necessary to qualify for award of this project; however, consideration will be given for recent, successful D-B team experience between the construction firm and design firms(s).

3) Military Construction: Familiarity with federal regulations and administration of Corps of Engineers or other federal contracts are considered relevant. Corps of Engineer projects are considered more relevant than those of other Federal agencies, state, or local experience. Corps of Engineers projects at Fort Hood, Texas than Corps of Engineer Projects at other Military Installations.

4) Previous experience as a team. Extent to which members of the proposed team have worked together on previous projects as a team will be considered. Design team experience, construction team experience, and design-construction team experience are all considered relevant.

5) Experience at Dyess AFB or in Abilene, Texas: Familiarity with Dyess AFB installation requirements and the local vicinity is considered relevant.

3.3 FACTOR 3: MANAGEMENT EFFECTIVENESS (VOLUME II, TAB 3). The Government will evaluate the Offeror's management effectiveness by considering the Offeror's understanding and capability of successfully managing the project to completion. The following elements will be evaluated:

- Organizational Chart or Structure
- Key Personnel Resumes.
- Project Management Plan
- Small and Small Disadvantaged Business Utilization.

3.3.1 Offeror's Submission Requirements.

3.3.1.2 Organizational Chart or Structure. Provide an organizational chart that clearly shows lines of authority and communication chain of the organization, including key personnel. Offerors are encouraged to provide descriptive analysis of why they feel their key personnel meet the criteria for key personnel experience.

3.3.1.3. Key Personnel Resume Information Personnel Information consist of two subfactors: Design-Build Personnel and Letters of Commitment. Résumés shall be submitted in the following format:

Name/Title	
Proposed Duties & Functions Proposed Designer-of-Record: [Y] [N] for design discipline [_____] (Insert design discipline in blank space)	
Firm Affiliation/Years Affiliated	
Education: Degree Year Specialization	
Active Registrations (including dates) and/or Professional/Technical Certifications/Licenses	
Experience relevant to proposed project, including the years of experience performing proposed duties & functions. For each project listed below, identify the length of time key personnel stayed on their contracts and how well they managed their portion of the referenced contracts.	
Specific Qualifications relevant to proposed project	
List of Relevant Projects: For each project listed, provide: -- Project Title -- Project Description -- Type (D-B, Construction, etc.) -- Dollar Value -- Year Completed -- Individual's project assignment to include specific roles and responsibilities, dates worked on project, and project's relevance to this solicitation. -- Identify the length of time key personnel stayed on their contracts and how well they managed their portion of the referenced contracts.	

a) DESIGN-BUILD PERSONNEL

The Offeror shall submit the résumés on lead and support design, construction, and management personnel who will work on this project. Provide summaries of the duties and responsibilities of these individuals, which clearly indicate the duties, and responsibilities for each of the individuals. Key personnel identified in this tab shall be Contractor's senior working-level people who will be involved in design and construction on a day-to-day basis as opposed to departmental level supervisors or executives. Key personnel shall have experience in design and construction of projects similar to that of this Contract. Resumes shall list projects, identified in the subfactor DESIGN EXPERIENCE (Tab 3A), that show previous working relationships among key personnel. Minimum personnel qualifications are specified in Sections 01012 SUBMITTALS DURING DESIGN, Part 1 paragraph DESIGN AND CONSTRUCTION PERSONNEL QUALIFICATIONS; 01320 PROJECT SCHEDULE; 01430 DESIGN QUALITY CONTROL; and 01451 CONTRACTOR QUALITY CONTROL. The proposal shall clearly present the credentials of each person, and shall show that each meets the requirements listed in the Contract. Resumes shall include examples of project experience and educational qualifications. If reassignment of personnel is considered possible, provide the names and resumes of the alternate professionals in each assignment. The design-build team shall consist of the following, as a minimum:

- Project Manager
- Lead Architect
- Landscape Architect
- Lead Civil Engineer
- Lead Structural Engineer
- Lead Mechanical Engineer
- Lead Electrical Engineer
- Design Quality Control Manager
- Construction Quality Control Manager
- Project Superintendent
- Project Scheduler
- Geologist/Geotechnical Engineer

b) LETTERS OF COMMITMENT

In an appendix, provide letters of commitment for all key personnel on the Design-Build team and any proposed alternate personnel. By identifying these personnel, the offeror is making a commitment that, barring unforeseen circumstances, they are the personnel who will be assigned to the project. A letter of commitment from each firm committing specific individuals from the firm may be provided in lieu of separate letters for each individual. After contract award, substitutions for any of the key personnel or alternates shall require the Contracting Officer's approval.

3.3.1.4 PERSONNEL– EVALUATION

PERSONNEL contain two subfactors: Design-Build Personnel and Letters of Commitment. Design-Build Personnel is significantly more important than Letters of Commitment will be evaluated as Acceptable or Unacceptable. Personnel of primary teaming partners will be recognized and evaluated in the same manner as Personnel of the Offeror. PERSONNEL will be evaluated as follows:

a) DESIGN-BUILD PERSONNEL

Experience on similar projects, education, responsibilities/duties, and years of experience will be evaluated for the key construction personnel identified. Offerors with key design or construction personnel with prior experience on military construction projects and/or completion of design-build projects may receive a more favorable evaluation. Consideration will be given to sustainable design experience.

b) LETTERS OF COMMITMENT

Are letters of commitment for the duration of the Contract provided for each of the design-build team members provided?

3.3.2 Project Management Plan (PMP)

a) PROJECT MANAGEMENT PLAN (PMP)

The Offeror shall provide a comprehensive Project Management Plan (PMP) developed specifically for implementation of this Contract. The PMP shall discuss the management approach used for design, site clearing and demolition, construction, turn-over of all units of this contract within the proposed schedule. The PMP shall discuss turnover of the finished units, as required by the contract, and how it will be achieved within the proposed schedule. The information in the PMP shall make it clear that the Offeror has the ability to deliver a quality product and effectively manage the designers, consultants, and subcontractors on the team, as well as the ability to coordinate all work throughout the design and construction phases. The PMP shall include an explanation of the total project team management approach for both the design team and the construction team. It shall include: management of firms included within the design team and construction team, specific quality control procedures used (including Quality Control procedures to be used to limit re-submittals, design errors, and poor coordination between the design firm and design consultant), schedule development, and methods to be utilized to adhere to the schedule. Address the acquisition of environmental permits in a timely fashion; safety; preparation and submission of record (i.e. as-built) documents, and contract closeout. Discuss how the design team will support the Offeror during construction and an organizational chart showing the inter-relationship of management and various team components, including the Corps of Engineers and the Army. Address the relationship between designer and construction contractor and clearly indicate an understanding of the design-build process. In addition:

- (1) Identify the items of work to be self-performed by offeror and the percentage of the overall contract value that this work represents.
- (2) Describe the team's computer-aided drafting and design (CADD) capabilities. Identify the CADD software to be used in the design of this project; if all disciplines are not using the same CADD software, identify the software that each discipline is using. Discuss compatibility with the Government's target CADD and compliance with the Tri-Service A/E/C/ CADD standards. Explain how compatibility will be achieved if the design, or portion of the design, is prepared using a CADD system other than the Government's target CADD system. (Refer to Section 01012 SUBMITTALS DURING DESIGN for information on the Government's target CADD system and compatibility requirements).

PROJECT MANAGEMENT – EVALUATION

PROJECT MANAGEMENT will be evaluated as follows:

a) PROJECT MANAGEMENT PLAN (PMP)

Project Management Plans will be evaluated for inclusion of all tasks identified in the Project Management Plan submittal paragraph above. The ability of the Offeror's plan to deliver a quality product and effectively manage the construction team and coordinate all work throughout the design and construction phase of this project will be evaluated. Higher evaluation ratings can be achieved with a thoroughly explained Project Management Plan suitable for the scope and complexity of this project, and which addresses each of the following:

- Management Approach
- Sub-Contractor Management
- Quality Control Procedures
- Schedule development and adherence (Phased Turn-Over)
- Organization Chart
- Acquisition of Environmental Permits
- Safety
- Preparation and submission of record (i.e. as-built) documents
- Contract closeout
- What is the work that will be self-performed by the offeror and what is the percentage of the overall contract value that this work represents? This percentage will be compared to the minimum specified in Contract Clause 52.236-1 PERFORMANCE OF WORK BY THE CONTRACTOR.
- The team's computer-aided drafting and design (CADD) capabilities:
 - Is the CADD software to be used in the design of this project identified?
 - If all disciplines are not using the same CADD software, is the software that each discipline is using identified and which discipline will be responsible for the final set?
 - Is this software compatible with the Government's target CADD and in compliance with the Tri-Service A/E/C/ CADD standards?
 - How will compatibility be achieved if the design, or portion of the design, is prepared using a CADD system other than the Government's target CADD system?

3.3.3 Small and Small Disadvantaged Business Utilization. ALL OFFERORS are required to provide a narrative discussion of their plan for utilization of small and small disadvantaged businesses. At a minimum, the narrative shall discuss:

3.3.3.1 Goals for subcontracting with small and small disadvantaged businesses in sufficient detail to allow Government evaluators to determine that these goals are realistic, justifiable, positive, and in accordance with the Government's policy to maximize opportunities for these types of businesses.

3.3.3.2 The extent to which small disadvantaged businesses, and where appropriate, historically black colleges and universities/minority institutions (HBCU/MI) have been identified for participation as part of the Offeror's team.

3.3.3.3 The Offeror's past and present commitment to providing subcontracting opportunities and encouragement to small and small disadvantaged businesses.

3.3.3.4 Evaluation Small and Small Disadvantaged Business Utilization. The Government will evaluate narratives provided for the following elements. Greater detail and specificity will be given greater credit than general statements and commitments:

3.3.3.4.1 The extent to which the goals for subcontracting with small and small disadvantaged businesses are realistic, justifiable, positive, and in accordance with the Government's policy to maximize opportunities for these types of businesses.

3.3.3.4.2 The extent to which small disadvantaged businesses, and where appropriate, historically black colleges and universities/minority institutions (HBCU/MI) have been identified for participation as part of the Offeror's team.

3.3.3.4.3 The Offeror's past commitment to providing subcontracting opportunities and encouragement to small and small disadvantaged businesses.

3.4 FACTOR 4: PROJECT DURATION (VOLUME II, TAB 4). The Government's requirement is that all work on this project be completed within (*See Section 01000, Construction Schedule*) days of Notice to Proceed, inclusive of all review periods and Government phasing requirements specified. Offeror may propose a completion period of lesser duration. Completion periods of significantly lesser duration may be rated as more advantageous to the Government. **If a completion period of lesser duration is proposed and accepted by the Government, the accepted completion period will replace the original construction schedule listed under Section 01000. If an alternate completion period is proposed, the Bid Schedule must reflect pricing information for the alternate proposed completion period.** Offers who propose completion of the work beyond the maximum completion period specified above, will be rated unsatisfactory for this factor.

3.4.1 PROJECT SCHEDULE Offeror's Submission Requirements.

The Offeror shall provide a project schedule for design, site clearing and demolition, and construction work. Prepare in the form of a time-scaled (Gantt Chart) summary network diagram and graphically indicate sequences proposed to accomplish each general work operation including design and design reviews, demolition, construction, phased turn-over of accepted units, final clean-up of premises, demolition in preparation for renovation and appropriate interdependencies among various activities. The schedule shall illustrate when finished units will be turned over. The proposed project schedule shall clearly indicate the total number of calendar days from the 20th day after Contract Award. The proposed completion time will be a contract requirement. If the Offeror fails to complete the work within the time specified, the Offeror will be subject to liquidated damages (if applicable).

The Offeror shall provide a verification statement that the Contractor has read the contract requirements and that the number of days includes all design time, Government review time of all design submittals, construction time, and demolition time necessary to complete the project. The duration shall reflect the design and design review requirements addressed in the Section 01012 SUBMITTALS DURING DESIGN.

3.4.2 Evaluation. This factor will be evaluated by reviewing the submitted scheduling documents. Completion periods of significantly lesser duration may be rated as more advantageous to the Government. Offers who propose completion of the work beyond the maximum completion period specified above, will be rated unsatisfactory for this factor.

4. EVALUATION STANDARDS. Evaluation criteria (factors) will be rated using the following adjectival descriptions. Evaluators will apply the appropriate adjective to each criterion rated. The evaluator's narrative explanation must clearly establish that the Offeror's submittal meets the definitions established below. As each criteria is evaluated an assessment of Performance Risk will be made. Performance Risk relates to the assessment of an Offeror's present and past work and accomplishments to determine the Offeror's ability to successfully perform as required.

4.1 OUTSTANDING - Information submitted demonstrates Offeror's potential to significantly exceed performance or capability standards. The Offeror has clearly demonstrated an understanding of all aspects of the requirements to the extent that timely and highest quality performance is anticipated. The Offeror possesses exceptional strengths that will significantly benefit the Government. The Offeror's qualifications meet the fullest expectations of the Government. The Offeror has convincingly demonstrated that the RFP requirements have been analyzed, evaluated, and synthesized into approaches, plans, and techniques that, when implemented, should result in highly effective and efficient performance under the contract which represents very low risk to the Government. An assigned rating of "outstanding" indicates that, in terms of the specific factor, the submittal contains no significant weaknesses, deficiencies or disadvantages. Offeror very significantly exceeds most or all solicitation requirements. Very high probability of success. Very low risk to the Government.

4.2 ABOVE AVERAGE - Information submitted demonstrates Offeror's potential to exceed performance or capability standards. Offeror possesses one or more strengths that will benefit the Government. The areas in which the Offeror exceeds the requirements are anticipated to result in a high level of efficiency, productivity, or quality. The Offeror's qualifications are responsive with minor weaknesses, but no major weaknesses noted. An assigned rating of "Above Average" indicates that, in terms of the specific factor, any weaknesses noted are minor and should not seriously affect the offeror's performance. The submittal demonstrates that the requirements of the RFP are well understood and the approach will likely result in a high quality of performance which represents low risk to the Government. A rating of "Above Average" is used when there are no indications of exceptional features or innovations that could prove to be beneficial, or conversely, weaknesses that could diminish the quality of the effort or increase the risks of failure. Disadvantages are minimal. The submittal contains excellent features that will likely produce results very beneficial to the Government. Offeror fully meets all RFP requirements and significantly exceeds many of the RFP requirements. Response exceeds a "Satisfactory" rating. High probability of success. Low risk to the Government.

4.3 SATISFACTORY (Neutral) - Information submitted demonstrates Offeror's potential to meet performance or capability standards. Offeror presents an acceptable solution and meets minimum standard requirements. Offeror possesses few or no advantages or strengths. The Offeror's proposal contains weaknesses in several areas that are offset by strengths in other areas. A rating of "Satisfactory" indicates that, in terms of the specific factor, the Offeror may satisfactorily complete the proposed tasks, but there is at least a moderate risk that it will not be successful. There is a good probability of success and that a fully acceptable level of performance will be achieved. Offeror meets all RFP requirements, presents a complete and comprehensive proposal, exemplifies an understanding of the scope and depth of the task requirements, and displays understanding of the Government's requirements. Offeror's response exceeds a "Marginal" rating. No significant advantages or disadvantages. Moderate risk to the Government. In the case of no past performance on the part of the Offeror, a SATISFACTORY rating will be assigned for Past Performance.

4.4 MARGINAL - Information submitted demonstrates Offeror's potential to marginally meet performance or capability standards necessary for minimal but acceptable contract performance. The submittal is not adequately responsive or does not address the specific factors. The assignment of a rating of "Marginal" indicates that mandatory corrective action would be required to prevent significant deficiencies from affecting the overall project. The Offeror's qualifications demonstrate an acceptable understanding of the requirements of the RFP and the approach will likely result in an adequate quality of performance, which represents a moderate level of risk to the Government. Offeror displays low probability of success, although the submittal has a reasonable chance of becoming at least acceptable. Offeror's response exceeds an "Unsatisfactory" rating. Significant disadvantages. High risk to the Government.

4.5 UNSATISFACTORY – Information submitted fails to meet performance or capability standards necessary for acceptable contractor performance. The Offeror's interpretation of the Government's requirements is so superficial, incomplete, vague, incompatible, incomprehensible, or incorrect as to be Unsatisfactory. The submittal does not meet the minimum requirements of the RFP; requirements could only be met with major changes to the submittal. There is no reasonable expectation that acceptable performance would be achieved which represents unacceptably high risk to the Government. The Offeror's qualifications have many deficiencies and/or gross omissions; fail to provide a reasonable, logical approach to fulfilling much of the Government's requirements; and, fail to meet many of the minimum requirements. The Offeror's qualifications are so unacceptable that it would have to be completely revised in order to attempt to make them acceptable. Very significant disadvantages. Unacceptably high risk to the Government.

5. TECHNICAL EVALUATION WEIGHTS

5.1 Relative Importance Definition. For the purpose of this evaluation, the following terms will be used to establish the relative importance of the technical factors and subfactors.

- **Significantly More Important:** The criterion is at least two times greater in value than another criterion.
- **More Important:** The criterion is greater in value than another criterion but less than two times greater.
- **Equal:** The criterion is of the same value or nearly the same as another criterion.

5.2 PRICE is approximately Equal in importance to ALL TECHNICAL FACTORS when combined.

5.3 Weight among technical factors :

FACTOR 1: DESIGN & CONSTRUCTION PAST PERFORMANCE: This factor is equal to Factor 2 and Factor 3 and less important than Factor 4.

FACTOR 2: CORPORATE RELEVANT SPECIALIZED EXPERIENCE: This Factor is equal in importance to Factor 1 and Factor 3 and is less important than Factor 4.

FACTOR 3: MANAGEMENT EFFECTIVENESS: This Factor is equal in importance to Factor 2 and Factor 3 and is less important than Factor 4.

FACTOR 4: PROJECT DURATION. This factor is more important than the above factors combined.

6. PRICE.

6.1 The Government will perform a price analysis on all proposals received. Price analysis will be performed in accordance with FAR 15.404-1, to determine completeness, reasonableness, and understanding of the work. The evaluation will determine the adequacy of the offer in fulfilling the requirements of the proposal. Completeness addresses the extent to which the elements of the price proposal are consistent with the requirements of the RFP. Reasonableness will be established using historical price information, price competition information, the IGE, and any other pricing tools necessary.

6.2 Price will not be scored, but will be a factor in establishing the competitive range prior to discussions (if held) and in making the final best value determination for award.

7. EXCEPTIONS. Exceptions to the contractual terms and conditions of the solicitation (e.g., standard company terms and conditions) may result in a determination to reject a proposal.

8. RESTRICTIONS. Failure to submit all the data in the format indicated in this solicitation may be cause for determining a proposal incomplete and, therefore, not considered for evaluation, and for subsequent award.

9. PROPOSAL EVALUATION.

9.1 Each member of the Government evaluation team (Source Selection Evaluation Board) will independently consider all information provided in the proposal. Worksheets are provided on the following pages, which the evaluators will use to review and rate the individual proposals.

9.2 Once these individual analyses are completed, the team will meet and determine a rating for each of the evaluation factors by consensus decision.

9.3 The evaluation team will document strengths (e.g., advantages), weaknesses (e.g., disadvantages), and other comments (e.g., deficiency and/or clarification) to support the rating for each factor, as well as the overall rating. Documentation and comments are required for all ratings.

9.4 Based on the preceding evaluation of each rated area, including consideration of the price proposal, the evaluator will make a preliminary determination of acceptability for each proposal. This determination will be based on the following criteria:

- a. “Acceptable” – The proposal contains no deficiencies and it conforms completely to the solicitation requirements (this does not necessarily eliminate the need for discussion of its weaknesses).
- b. “Marginally Acceptable” – The proposal can reasonably be expected to be made acceptable by moderate revision, amplification, or modification. If a proposal falls within this category, the documentation must specify in detail the areas(s) in which the proposal is deficient.
- c. “Unacceptable” – The proposal could not reasonably be expected to become “acceptable” without major, extensive changes and revisions. Unless the rationale clearly supports the determination of unacceptability, the determination shall be “marginally acceptable.”

The above determinations will be made and documented under the initial and Consensus Summary Sheets. SSEB team members will document their ratings for all factors and sub factors on the applicable worksheets. Questions for the offeror will be noted for future reference.

10. BASIS FOR AWARD

10.1 Proposals must meet the criteria stated in the RFP in order to be eligible for award, to include responsiveness, technical acceptability and responsibility.

10.2 In order to determine which proposal represents the best overall value, the Government may compare proposals to one another. The Government will award a contract to the responsible Offeror whose technical submittal and price proposal contains the combination of those criteria described in this document offering the best overall value to the Government. Best value will be determined by a comparative assessment of proposals against all source selection criteria in this RFP.

10.3 As technical ratings and relative advantages and disadvantages become less distinct, differences in price between proposals are of increased importance in determining the most advantageous proposal. Conversely, as differences in price become less distinct, differences in rating and relative advantages and disadvantages between proposals are of increased importance to the determination. In the event that the technical and cost/price proposals become more equivalent for two or more large businesses, the subcontracting plan will become more significant and may become the determining factor for award.

10.4 The Government reserves the right to accept other than the lowest priced offer. The right is also reserved to reject any and all offers. The basis of award will be a conforming offer, the price or cost of which may or may not be the lowest. If other than the lowest offer, it must be sufficiently more advantageous than the lowest offer to justify the payment of additional amounts. Any award price must be determined to be fair and reasonable.

10.5 Offerors are reminded to include their best technical and price terms in their initial offer and not to automatically assume that they will have an opportunity to participate in discussions or be asked to submit a revised offer. The Government may make award of a conforming proposal without discussions, if deemed to be within the best interests of the Government.

10.6 The Government intends to award a contract without discussions based on initial proposals received; therefore, the proposals shall contain the offeror’s best terms from a cost and technical standpoint. However, the

Government reserves the right to conduct discussions in accordance with FAR 52.215-1. Should discussions be necessary after evaluations, the Government will establish a competitive range of the offerors that are the most highly rated. The Government reserves the right to address any pertinent issues in the proposals.

End of Proposal Submission Instructions, Conditions

Proposal Data Sheets are on the following pages

VOLUME I – TAB D

PROPOSAL DATA SHEET

PROJECT TITLE: **Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects**
PROJECT LOCATION: **Fort Hood, Texas**

1. Name of Firm:

Address:

Phone:

Fax:

E-mail:

Duns # (used for accessing ACASS/CCASS)

If a joint venture or contractor-subcontractor association of firms, list the individual firms and briefly describe the nature of the association.

Firm 1:

Firm 2:

Firm 3:

Nature of Association:

2. AUTHORIZED NEGOTIATORS. FAR 52.215-11

The Offeror represents that the following persons are authorized to negotiate on its behalf with the Government in connection with this Request for Proposals (RFP).

[List names, titles, and telephone number of the authorized negotiator.]

Name of Person Authorized to Negotiate:

Negotiator's Address:

Negotiator's Telephone:

Negotiator's E-mail:

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects**
PROJECT LOCATION: Fort Hood, Texas
VOLUME II – TAB 1

Am 0002

FACTOR 1: Design & Construction Past Performance (At least three projects but no more than five).

1. On an attached sheet, provide information for no more than five completed projects, preferably of similar design or features, that have been constructed by the offeror to be used for reference and evaluation purposes. All **(Am 0002) completed** projects listed in Factor 2, "Corporate Specialized Relevant Experience" shall have a completed Past Performance Information Sheet.

2. For each project provide the following information:

Project Title:

Location:

Contract number:

Procuring activity:

Procurement Point of Contact and Telephone Number:

Address and telephone number of owner/customer:

Type of Project (private sector, Government, planned unit development, etc.):

General Nature of the Contract:

Award Date:

Original Contract Amount:

Final Contract Amount:

Original Completion Date:

Final Completion Date:

Explanation for any differences between original and final contract costs and completion dates:

SAMPLE
(Offerors should submit for at least three projects but no more than five)

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects**
PROJECT LOCATION: Fort Hood, Texas

VOLUME II – TAB 2

Am 0002

FACTOR 2: CORPORATE SPECIALIZED RELEVANT EXPERIENCE.

On an attached sheet, provide information for no more than five completed projects that are similar in terms of cost, complexity, design or features, (See elements identified in paragraph 3 of Section **(Am 0002) 00110 00100**) that have been constructed by the Offeror to be used for reference and evaluation purposes. For each project provide the following information:

Project Title:

Location:

Contract number:

Nature of involvement in this project, i.e. General Contractor, subcontractor, designer:

Procuring activity:

Procurement point of contact and telephone number:

List date of construction completion or percent completion if construction is underway:

Address of building(s):

Name, address and telephone number of owner:

Indicate type of project (private sector, Government, planned unit development, etc.):

Total cost:

Technical relevancy to this project:

Offeror: _____

Evaluator: _____

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects
PROJECT LOCATION: Fort Hood, Texas**

PROPOSAL RATING WORKSHEET

Am 0002

FACTOR 1 – Design & Construction PAST PERFORMANCE

1. GENERAL. The Government will evaluate each Offeror's past performance to determine how well it satisfied its customers. Evaluators will use this factor to evaluate the success of the Offeror based on the satisfaction of previous customers and clients as illustrated on the completed questionnaires, **(Am 0002) ACCASS ~~CCASS~~** Ratings and personal knowledge. These completed questionnaires shall be used as a basis to begin the evaluation of this factor.

Do All the submitted Projects Reflect Projects completed
within the Last Five Years?

_____ YES _____ NO

2. ACASS RATINGS.

Firm Name: _____

Number of Ratings:	Outstanding	_____
	Above Average	_____
	Satisfactory	_____
	Marginal	_____
	Unsatisfactory	_____

3. NON-CORPS OF ENGINEERS CONTRACT RATINGS.

Firm Name: _____

Number of Ratings:	Outstanding	_____
	Above Average	_____
	Satisfactory	_____
	Marginal	_____
	Unsatisfactory	_____

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4. OTHER INFORMATION CONSIDERED. List all other sources of information considered (telephone interviews, personnel interviews, personal experience, etc.)

Offeror: _____

Evaluator: _____

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects
PROJECT LOCATION: Fort Hood, Texas**

PROPOSAL RATING WORKSHEET

FACTOR 1 – Design & Construction PAST PERFORMANCE

1. GENERAL. The Government will evaluate each Offeror's past performance to determine how well it satisfied its customers. Evaluators will use this factor to evaluate the success of the Offeror based on the satisfaction of previous customers and clients as illustrated on the completed questionnaires, CCASS Ratings and personal knowledge. These completed questionnaires shall be used as a basis to begin the evaluation of this factor.

Do All the submitted Projects Reflect Projects completed
within the Last Five Years?

_____ YES _____ NO

2. CCASS RATINGS.

Firm Name: _____

Number of Ratings:	Outstanding	_____
	Above Average	_____
	Satisfactory	_____
	Marginal	_____
	Unsatisfactory	_____

3. NON-CORPS OF ENGINEERS CONTRACT RATINGS.

Firm Name: _____

Number of Ratings:	Outstanding	_____
	Above Average	_____
	Satisfactory	_____
	Marginal	_____
	Unsatisfactory	_____

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4. OTHER INFORMATION CONSIDERED. List all other sources of information considered (telephone interviews, personnel interviews, personal experience, etc.)

Offeror: _____

Evaluator: _____

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects**
PROJECT LOCATION: Fort Hood, Texas

PROPOSAL RATING WORKSHEET

FACTOR 1 – Design & Construction PERFORMANCE (Continued)

OVERALL RATING.

/__ / Outstanding

/__ / Above Average

/__ / Satisfactory

/__ / Marginal

/__ / Unsatisfactory

Comments to support the OVERALL RATING

STRENGTHS.

WEAKNESSES.

OTHER COMMENTS (Clarifications, omissions/errors/deficiencies)

Offeror: _____

Evaluator: _____

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects**

PROJECT LOCATION: Fort Hood, Texas

PROPOSAL RATING WORKSHEET

FACTOR 2 – CORPORATE RELEVANT SPECIALIZED EXPERIENCE

1. General: Completed DATA SHEETS shall be used as a basis to begin the evaluation of this factor.

Has Government Received Completed DATA SHEETS for Corporate Relevant Specialized Experience for this Offeror?

___ YES ___ NO

Do All the DATA SHEETS Received Reflect Projects Completed Within the Last Five Years?

___ YES ___ NO

OVERALL RATING.

/___/ Outstanding

/___/ Above Average

/___/ Satisfactory

/___/ Marginal

/___/ Unsatisfactory

Comments to support the OVERALL RATING

STRENGTHS.

WEAKNESSES.

OTHER COMMENTS (Clarifications, omissions/errors/deficiencies)

Offeror: _____

Evaluator: _____

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects**
PROJECT LOCATION: Fort Hood, Texas

PROPOSAL RATING WORKSHEET
FACTOR 3 – MANAGEMENT EFFECTIVENESS

OVERALL RATING.

/__ / Outstanding

/__ / Above Average

/__ / Satisfactory

/__ / Marginal

/__ / Unsatisfactory

Comments to support the OVERALL RATING

STRENGTHS.

WEAKNESSES.

OTHER COMMENTS (Clarifications, omissions/errors/deficiencies)

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Offeror: _____

Evaluator: _____

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects**
PROJECT LOCATION: Fort Hood, Texas

PROPOSAL RATING WORKSHEET
FACTOR 4 – CONSTRUCTION DURATION

OVERALL RATING.

/__ / Outstanding

/__ / Above Average

/__ / Satisfactory

/__ / Marginal

/__ / Unsatisfactory

Comments to support the OVERALL RATING

STRENGTHS.

WEAKNESSES.

OTHER COMMENTS (Clarifications, omissions/errors/deficiencies)

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0011034

Offeror: _____

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects**
PROJECT LOCATION: Fort Hood, Texas

Summary and Overall Rating

SUMMARY RATING CHART			
FACTOR No.	Description	Rating*	Comments
1	Design & Construction Past Performance		
2	Corporate Relevant Specialized Experience		
3	Management Effectiveness		
4	Project Duration		
OVERALL TECHNICAL RATING**			
PROPOSAL ACCEPTABILITY			
<p>* Ratings may be either:</p> <p style="text-align: center;">Outstanding – Above Average – Satisfactory – Marginal – Unsatisfactory</p> <p>** Evaluators shall consider the ratings and weights of the various criteria shown to determine a suitable overall rating. The overall rating cannot be an average, mode, or median of the ratings of the four factors.</p> <p>Attach additional sheets to this rating summary to provide supporting rationale for assignment of ratings.</p>			

Board Member Signature

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Offeror _____

Board Chairperson _____

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects**
PROJECT LOCATION: Fort Hood, Texas

FACTOR No.	Description	Board Member 1	Board Member 2	Board Member 3	Board Member 4	Board Member 5	CONSENSUS
1	Offeror Past Performance*						
2	Corporate Relevant Specialized Experience*						
3	Management Effectiveness*						
4	Project Duration*						
OVERALL RATING**							

Board Member 1

Board Member 2

Board Member 3

Board Member 4

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Offeror: _____

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects**
PROJECT LOCATION: Fort Hood, Texas

CONSENSUS RATINGS

FACTOR 1 – OFFEROR PAST PERFORMANCE

STRENGTHS:

WEAKNESSES:

OTHER COMMENTS

FACTOR 2 – CORPORATE RELEVANT SPECIALIZED EXPERIENCE

STRENGTHS:

WEAKNESSES:

OTHER COMMENTS (Clarifications, omissions/errors/deficiencies)

Offeror: _____

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects**
PROJECT LOCATION: Fort Hood, Texas

CONSENSUS RATINGS
(Continued)

FACTOR 3 – OFFEROR MANAGEMENT EFFECTIVENESS

STRENGTHS:

WEAKNESSES:

OTHER COMMENTS

Offeror: _____

**PROJECT TITLE: Design-Build Miscellaneous Construction,
Renovation, & Alternation Projects**
PROJECT LOCATION: Fort Hood, Texas

CONSENSUS RATINGS

(Continued)

FACTOR 4 – PROJECT DURATION

STRENGTHS:

WEAKNESSES:

OTHER COMMENTS (Clarifications, omissions/errors/deficiencies)

AFARS -- Appendix DD Subcontracting Plan Evaluation Guide

June 1, 1996

Part 1 -- Introduction

DD-100 Purpose.

The guide provides a methodology for uniform and consistent evaluation of subcontracting plans within the Army. It is designed to facilitate compliance with the mandates of Public Law to increase opportunities for small and small disadvantaged businesses.

DD-101 Applicability.

Except for subcontracting plans for commercial items, use this guide to review all subcontracting plans, including those submitted in response to the conditions described in FAR 19.705-2(d) and DFARS 219.705-2(d). See 19.708(b)(1) for special notices to be inserted in the solicitation regarding submission of subcontracting plans. A copy of the completed evaluation shall be included in the contract file.

DD-102 Goals.

Contracting officers must place special emphasis on negotiating reasonable goals in subcontracting plans. The goals must be realistic, challenging and attainable. The plan must demonstrate a real commitment to, and an active involvement in, providing subcontracting opportunities for small and small disadvantaged businesses.

DD-103 Scoring.

Score subcontracting plans in the context of the particular procurement. For instance, in smaller dollar value contracts, it may be impracticable or not cost effective for offerors to take the type of actions that may be appropriate in contracts for larger dollar values. However, in such cases, offerors must still address each element of the guide and discuss what they intend to do regarding each element. Contracting officers shall then assign appropriate point scores.

DD-104 Modification of Guide. The evaluation guide and scoring system shall not be modified without the approval of the PARC. This approval authority may not be delegated.

DD-105 Use of Preaward Surveys.For contracts administered by the Defense Contract Management Agency (DCMA), information needed to assess contractor compliance with subcontracting plans in current and previous contracts may be obtained by requesting a preaward survey in accordance with FAR 9.106.

Part 2 -- Scoring System

Point Points

Range Assigned :

1. Policy statement or evidence of internal guidance to 0-5 company buyers recognizing commitment to Pub.L. 99-661, Section 1207, and Pub.L. 100-180, Section 806.

0 No written policy statement in plan.

1-2 Plan includes a general policy, but no evidence of recognition of special emphasis being placed on subcontracting with SDBs, HBCUs and MIs as a result of Pub.L.s.

3-5 Definitive corporate and management commitment evidenced in individual plan and master plan by **specifically referencing the Pub.L.s.**

Point Points

Range Assigned:

2. Efforts to broaden SB and SDB active vendor base. 0-10 (FAR 19.704(a), 52.219-9(d), DFARS Subpart 219.5, 219.704(a)(1), 219.705 and 252.219-7003)

0 Description of efforts merely parrots requirements of FAR to maintain listing of vendors.

1-2 Contains evidence that effort is directed at increasing subcontracts to SBs and SDBs for non-complex and general housekeeping supplies or services normally awarded to firms already in existing vendor base.

3-10 Addresses efforts to increase the number of SB and SDB sources awarded subcontracts, **establishes plans to use competition restricted to SDBs and gives details** about how plans to use competition restricted to SDBs will be accomplished. (DFARS 219.705-4 and Subpart 219.5)

Note: After scoring the plan to this point, if zero points have been assigned for Element 2, proceed to Item 3, Outreach. If one or more points have been assigned for this Element 2, proceed to evaluation of the subelements labeled “minus 2” and “minus 3” to determine if points assigned so far must be reduced. Do not reduce points already assigned to less than zero. (No negative points are to be entered under “Points Assigned” for any Element.) These negative scores are additive; if both of the subelements apply, then minus five points are assessed to reduce points already assigned under this element 2.

minus 2 Includes efforts described above which rate 1-2 or 3-10 points but, when it would be appropriate, does not address effort to involve HBCUs and MIs in performing the contract for which the subcontracting plan is submitted. (DFARS 219.704(a)(1) and 219.705-4(d))

minus 3 Includes efforts described above which rate 1-2 or 3-10 points but does not address effort to identify and overcome obstacles which may prohibit award to HBCU and MI sources currently in vendor base.

Point Points

Range Assigned :

3. Outreach (ongoing and planned actions) 0-10

(FAR 19.704(a), 19.705-4, 52.219-9(d) and

52.219-9(e), DFARS 219.705).

0 No mention of outreach.

1-4 Describes efforts to work with organizations in FAR 52.219-9(d)(11)(iv) to identify potential sources for items not traditionally awarded to SB or SDB firms. (FAR 52.219-9(d)(11)(iv) and 52.219-9(e))

5-10 Indicates intent to **conduct reviews** to determine the competence, ability, experience and capacity available in SB or SDB firms and to **provide technical assistance** to SBs and SDBs **or** explains why such reviews or technical assistance are not appropriate. (FAR 19.705-4(c) and 52.219-9(e))

Note: After scoring the plan to this point, if zero points have been assigned for Element 3, proceed to Item 4, Description of supplies and services. If one or more points have been assigned for this Element 3, proceed to evaluation of the subelement labeled “minus 3” to determine if points assigned so far must be reduced. Do not reduce points already assigned to less than zero. (No negative points are to be entered under “Points Assigned” for any Element.)

minus 3 Fails to indicate the extent to which HBCU and MI participation will be considered and facilitated in performing the contract for which the subcontracting plan is submitted, or fails to indicate other efforts to increase HBCU and MI participation in future DoD acquisitions. (DFARS 219.705-4(d))

Point Points

Range Assigned:

4. Describes supplies and services to be subcontracted 0-10 and planned for subcontracting to SBs, SDBs, HBCUs and MIs. (FAR 19.705-4(d), 52.219-9(d)(3), 52.219-9(e) and DFARS 219.705).

0 No mention.

1-4 Generic list of routine supplies and services included in materials listing for the specific contract.

5-7 Indicates intent to review major product/system components and key project elements of R&D, construction, service and spare parts contracts for subcontracting to SBs, SDBs, HBCUs and MIs. (FAR 19.705-4(d)(3) and (4), 52.219-9(e)(1) and (2) and DFARS 219.705)

8-10 Substantive plan **actually targets specific** SBs, SDBs, HBCUs and MIs for review to determine their competence, ability, experience and capacity and identifies specific components or major portions of the acquisition for consideration of SB, SDB, HBCU or MI competition. Also, indicates intent to work with large business subcontractors for major subsystems or key project elements to ensure “flowdown” of this philosophy. (FAR 19.705-4(d) and DFARS 219.705)

Point Points

Range Assigned:

5. Describes specific efforts, based on results of efforts 0-15 described in Elements No. 3 and No. 4 to ensure that SB, SDB, HBCU and MI concerns have equitable opportunity to participate in acquisitions. (FAR 19.704(a), 19.705-4, 52.219-9(d) and DFARS 219.705).

0 No mention.

1-4 Description of efforts merely parrots FAR 19.704(a)(3)

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and (6) and 52.219-9(d)(8).

5-8 Describes how the company intends to evaluate its own SB and SDB award performance and program effectiveness against the established goals, both company-wide and for the individual plan being negotiated. (FAR 19.704(a)(1) and (6) and 52.219-9(d)(11)(v))

9-12 Includes SBs, SDBs, HBCUs and MIs **by name as members of original team for producing specific** major components or subassemblies, providing a major service or performing a significant **portion of the effort.** (DFARS 219.705-2(d))

13-15 Describes **special efforts to establish long-range relationships with SBs, SDBs, HBCUs and MIs, including leader-follower techniques, when appropriate.** (FAR 19.705-4(d)(4) and DFARS 219.705-2(d))

Point Points

Range Assigned:

*6. Development of percentage goal is based on planned 0-40 subcontracting which is challenging, yet realistic.
(FAR 19.705-4(d), DFARS 219.704(a)(1) and 219.705-4).*

0 Fails to include a specific goal for subcontracting with SBs, SDBs, HBCUs and MIs or proposes zero percent goal without substantive justification.

1-5 Sets small business goal of less than 10 percent and/or SDB/HBCU/MI goal of two percent or less with no significant justification.

6-10 Sets goals of less than 10 percent (SB) and 2 percent (SDB), but contractor shows evidence of reasonable effort, including use of set-asides, to involve Sbs, SDBs, HBCUs or MIs in non-traditional areas.

11-20 Sets goals of over 10 percent (SB) and 2 percent (SDB) and also identifies specific SB, SDB, HBCU or MI concerns planned to be subcontractors, **including the item or service or effort to be subcontracted.** Indicates

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extent to which firms have **participated in proposal preparation or otherwise indicates extent to which subcontracting to these firms may reasonably be assured.**

Goals are realistic in view of actions stated in other portions of the plan and make-or-buy plan, if applicable.

21-30 Same as for 11-20 points, but proposed percent of goal is reasonable in comparison with prior experience, yet **indicates reasonable effort to improve on past experience in terms of dollars, number** of SDBs, HBCUs, and MIs involved, and movement into area without previous SDB, HBCU or MI involvement.

31-40 Same as 21-30 points, but includes evidence that if SBs, universities or institutions other than HBCUs or MIs are performing on a major component or subassembly, providing a major service or performing on a key project element, SDBs, HBCUs and MIs will also be given an opportunity to perform. Also, the percentage of the SDB, HBCU, MI goal compares favorably with the percentage of SB goal, consistent with the Government-wide goals of 20 percent to SB with five percent to SDB, or is otherwise explained, **and the plan includes a forecast for improvement.** (The SB and SDB goals in the subcontracting plan should approximate the ratio between the SB and SDB Government-wide goals.)

Point Points

Range Assigned:

7. Past performance. 0-10

Extent to which the company has historically been successful in establishing realistic, yet challenging, goals and achieving them. Consider DCMC comments on prime contractor's justifications for prior failure to achieve goals. To avoid penalizing the contractor when there has been no previous defense contract, assign 10 points. (FAR 19.705-4(d)(1) and (d)(2)(iii), 19.706 and DFARS 219.706).

8. *Other regulatory and statutory requirements.*

If any of the following are answered “NO,” the plan is not acceptable and must be revised to comply prior to award: Does the plan have --

A. A separate goal for SB and SDB? (FAR 19.704(a)(1) and FAR 52.219-9(d)(1) and (2))

YES NO

B. A separate goal for the basic contract and, if applicable, each option? (FAR 19.704(c))

YES NO

C. The name of the company employee responsible for administration of plan and employee’s duties? (FAR 19.704(a)(2) and 52.219-9(d)(7))

YES NO

D. A statement affirming intent to comply with subcontracting “flowdown” provisions? (FAR 19.704(a)(4) and 52.219-9(d)(10))

YES NO

E. A statement affirming willingness to cooperate in studies and to provide reports? (FAR 19.704(a)(5) and 52.219-9(d)(10))

YES NO

F. A statement that indirect costs are either included or excluded from the proposed goals and, if included, how they will be prorated? (FAR 52.219-9(d)(6))

YES NO

G. A description of efforts to ensure that SBs and SDBs have an equitable opportunity to participate in the acquisition? (FAR 52.219-9(d)(8))

YES NO

H. A recitation of the types of records maintained to demonstrate procedures adopted to comply with the requirements and goal in the plan? (FAR 52.219-9(d)(11))

YES NO

SECTION 00800

SPECIAL CONTRACT REQUIREMENTS (SCR)

The following clauses and other specific contract requirements have been moved. The following chart represents those changes.

CLAUSES & OTHER REQUIREMENTS PREVIOUSLY LOCATION IN SECTION 00800		NEW LOCATION
FAR Clauses		
Commencement, Prosecution And Completion Of Work (Apr 1984)	52.211-10	Section 00700
Time Extensions (Apr 1984)	52.211-13	Section 00700
Variation In Estimated Quantity (Apr 1984)	52.211-18	Section 00700
Limitations On Subcontracting (Jan 1991)	52.219-14	Section 00700
Availability Of Funds (Apr 1984)	52.232-18	Section 00700
Availability And Use Of Utility Services (Apr 1984)	52.236-14	Section 00700
Quantity Surveys (Apr 1984)	52.236-16, Alternate I	Section 00700
DFARS Clauses		
Payment For Mobilization And Preparatory Work (Dec 1991)	252.236-7003	Section 00700
Payment For Mobilization And Demobilization (Dec 1991)	252.236-7004	Section 00700
Airfield Safety Precautions (Dec 1991)	252.236-7005	Section 00700
EFARS Clauses		
Equipment ownership and operating expense schedule	52.231-5000	Section 00700
Payment for materials delivered off-site	52.232-5000	Section 00700
Basis for Settlement of Proposals	52.249-5000	Section 00700
Other Specific Contract Requirements		
Time Extensions For Unusually Severe Weather (Oct 1989)		Section 01000
Payment For Utility Services (FAR 36.303(C)(6))		Section 01000
Superintendence Of Subcontractors		Section 01000
Coordination Of Construction With Cemetery Representatives		Section 01000
Damage To Work Alternate A/Alternate B		Section 01000

The clauses represented here may not be included in a particular solicitation, depending on the requirements. This list only represents changes made to the overall policy of clause location.

CORRESPONDENCE IDENTIFICATION

- a. The Contractor shall use a serial numbering system on all formal correspondence sent to the Contracting Officer or his representative. The Contractor will provide one original and two duplicate copies of all correspondence.
- b. The Contractor may use a Request for Information (RFI) system for drawing/specification clarifications, subject to the following conditions:
 1. The Contractor shall use a sequential numbering system for all RFI's separate and apart from the correspondence numbering system.
 2. The Contractor shall provide one original and two copies of all RFI's.
 3. The Contractor shall designate ONE individual responsible person, subject to approval by the Contracting Officer, for reviewing and issuing RFI's.

4. For projects requiring Network Analysis Systems (NAS), all RFI's shall identify the NAS activities directly or indirectly affected by the RFI on the progress schedule. The Contractor should anticipate a minimum of 10 calendar days for Government review and response.
5. No requests for deviations or variations from the contract by RFI will be allowed. Deviations/variations are to be submitted on ENG Form 4025 as described in Section 01330 Submittal Procedures.
6. The use of RFI's does not relieve the Contractor of the responsibility for reviewing the contract documents and coordinating the work to be performed. If the Contracting Officer determines that the RFI system is being used for other than its intended purpose, the Contracting Officer has the authority to discontinue the use of the RFI's for the remainder of the contract.

EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE

Whenever a contract or modification of contract price is negotiated, the Contractor's cost proposals for equipment ownership and operating expenses shall be determined in accordance with the requirements of EFARS 52.231-5000, EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE. Interested parties may purchase copies of EP 1110-1-8 (Volumes 1 through 12) by phoning (202) 783-3238, or by writing "Superintendent of Documents U.S. Government Printing Office, Washington, D.C. 20402." Major credit cards are accepted. An electronic copy of this publication may be found the US Army Corps of Engineers Publication web site at <http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/cecw.htm>.

PHYSICAL DATA (APR 1984) (FAR 52.236-4)

Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

- a. The physical conditions indicated on the drawings and in the specifications are the result of site investigations by surveys [and borings].
- b. Ground water levels

It has been observed that ground water levels in heavily timbered or grassed areas quite often undergo a significant temporary rise when the area is cleared and/or stripped. This increase in water level can hinder traffic and construction progress in the affected areas. The duration of the ground water rise varies considerably, depending on prevailing weather and/or climatic conditions. Ref: Yearbook of Agriculture, 1957, copy available for inspection in Fort Worth District Office.

REQUIRED INSURANCE

Pursuant to FAR 28.307-2, the Contractor shall procure and maintain during the entire period of his performance under this contract the following minimum insurance:

- a. Workers' compensation and employers' liability insurance in compliance with applicable state statutes, with a minimum employers' liability coverage of \$100,000.
- b. Comprehensive general liability insurance for bodily injury in the minimum limits of \$500,000 per occurrence. No property damage liability insurance is required.

- c. Comprehensive automobile liability insurance covering the operation of all automobiles used in connection with the performance of the contract in the minimum limits of \$200,000 per person and \$500,000 per occurrence for bodily injury and \$20,000 per occurrence for property damage. (See Contract Clause entitled Insurance--Work on a Government Installation)

HAZARDOUS MATERIALS ABATEMENT INSURANCE

- a. If hazardous materials (e.g. asbestos, lead-based paint, polychlorinated biphenyl (pcb) compounds) abatement/removal or any other work with hazardous materials is required under this contract and Comprehensive General Liability Insurance is required, the policy of insurance which covers the hazardous materials abatement/removal or other work with asbestos shall be a "per occurrence" policy as that term used in the insurance industry. A policy issued on a "claims made" basis or any other "short tail" basis will not be accepted.
- b. The Comprehensive General Liability per occurrence policy shall be obtained by the prime Contractor if the hazardous materials abatement work is performed by the prime Contractor's own work force, or by an hazardous materials abatement subcontractor(s), if the hazardous materials abatement work is subcontracted. The Contractor shall insert in the subcontract a requirement for the hazardous materials abatement subcontractor(s) to provide and maintain the insurance required by this paragraph. The Contractor shall maintain a copy of the subcontractor's proof of required insurance, and shall make such copy available to the Contracting Officer upon request.

EPA INDEMNIFICATION UNDER CERCLA - (42 U.S.C. 9619) -FIXED PRICE CONTRACT

- a. This clause will be modified by mutual agreement of the parties hereto within 180 days of the EPA's promulgation of final guidelines for carrying out the provision of Section 119 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended (42 U.S.C. 9619).
- b. Pursuant to 42 U.S.C. 9619, and upon determination by EPA that adequate pollution liability insurance is not available at a reasonable cost, EPA may, upon request of the Contractor, hold harmless and indemnify the Contractor against any liability, not compensated by insurance or otherwise, which results from a release of any hazardous substance or pollutant or contaminant, if such release arises from the Contractor's response action activities under this contract. It is understood that the Contractor's request must be expressly approved by EPA as a prerequisite for the Contractor to receive this indemnification.
- c. This indemnification will extend to any third party liability including the expenses of litigation or settlement arising from the Contractor's negligence in its performance or response action activities under this contract provided that no reimbursement will be allowed for any liabilities that were caused by conduct of the Contractor (including any conduct of its directors, managers, staff, representatives or employees) which was grossly negligent, constituted intentional misconduct or demonstrated a lack of good faith. Further, the Contractor shall not be indemnified for liability arising under strict tort liability or any other basis of liability other than negligence.
- d. No reimbursement will be made under this clause for any liability damage claim which does not exceed \$100,000 or the deductible amounts of the Contractor's insurance whichever is greater. It is expressly understood that the only source of funds available for reimbursements under this clause is the CERCLA Hazardous Substance Superfund and that any reimbursement will be subject to the availability of appropriations in the Superfund at the time such liabilities are represented by final judgments or by settlements approved in writing by EPA except to the extent that Congress may make appropriations to specifically fund any deficiencies.

- e. The Contractor agrees, in accordance with EPA Interim Guidance (OSWER Directive 9835.5), to make diligent efforts throughout contract performance to procure adequate pollution liability insurance and to provide documentation periodically or as required by the Contracting Officer to substantiate these efforts. Upon obtaining quotes for such insurance, the Contractor shall submit documentation as required by the Contracting Officer. The Contracting Officer will forward this documentation to EPA for its review and approval. Upon receipt of EPA approval, the Contractor will be entitled to reimbursement under the contract for the cost of pollution liability insurance allocable to this contract.
- f. If, during contract performance, approved or required insurance coverage is reduced by the Contractor without the Contracting Officer's approval, the liability of EPA under this clause will not be increased by reason of such reduction. It is understood that required pollution liability insurance coverage relates to the period of contract performance.
- g. The Contractor shall -
 - 1. Promptly notify the Contracting Officer and EPA of any claim or action against, or any loss by, the Contractor or any subcontractors that may reasonably be expected to involve indemnification under this clause;
 - 2. Immediately furnish to EPA copies of all pertinent papers the Contractor receives;
 - 3. Furnish evidence or proof of any claim, loss, or damage covered by this clause in the manner and form EPA requires; and
 - 4. Comply with EPA directions and execute any authorizations required in connection with settlement or defense of claims or actions.
- h. The Government may direct, control, or assist in settling or defending any claim or action that may involve indemnification under this clause.
- i. With the Contracting Officer's prior written approval, the Contractor may, in any subcontract under this contract, indemnify the subcontractor against the pollution liability addressed in paragraph (b). This indemnification shall provide between the Contractor and subcontractor, the same rights and duties, and the same provisions for notice, furnishing of evidence or proof and the like. The Contracting Officer may also approve indemnification of subcontractors at any lower tier in the form of indemnification agreements between subcontractors and under the same terms and conditions as in this clause. EPA will indemnify the Contractor against liability to subcontractors incurred under subcontract indemnification provisions.
- j. The rights and obligations of the parties under this clause shall survive this contract's termination, expiration, or completion. EPA may pay the Contractor or may directly pay parties to whom the Contractor may be liable.
- k. Nothing in this clause shall be construed as an indemnification agreement between the U.S. Army Corps of Engineers and the Contractor or subcontractor.

U.S. ARMY CORPS OF ENGINEERS SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385-1-I

Reference Federal Acquisition Regulation (FAR) Clause 52.236-13, Accident Prevention. Engineer Manual (EM) 385-1-I and its changes are no longer available as part of this solicitation/contract but rather is available at <http://www.hq.usace.army.mil> (select Safety and Occupational Health). Consequently, the Contractor shall be responsible for complying with the current edition and all changes posted on the web as of the effective date of this solicitation.

ELECTRONIC SUBMITTAL OF OFFEROR'S PROPOSAL

In accordance with Section 00110, Proposal Submission Requirements, the Offeror is required to submit an electronic copy of the initial proposal and one electronic copy of the final proposal revision, if applicable. In the event any discrepancy is discovered between the printed version of the offeror's submitted proposal and this electronic version, the printed version shall govern.

ACCESS TO AUTOMATED INFORMATION SYSTEMS (AIS)

All Contractor employees (U.S. citizens and Non- U.S. citizens) working under this contract (*to include grants, cooperative agreements and task orders*) who require access to Automated Information Systems (AIS), (stand alone computers, network computers/systems, e-mail) shall, at a minimum, be designated into an ADP-III position (non-sensitive) in accordance with DoD 5220-22-R, Industrial Security Regulation. The investigative requirements for an ADP-III position are a favorable National Agency Check (NAC), SF-85P, Public Trust Position. The contractor shall have each applicable employee complete a SF-85P and submit to the Fort Worth District Security Officer within three (3) working days after award of any contract or task order, and shall be submitted prior to the individual being permitted access to an AIS. Contractors that have a commercial or government entity (CAGE) Code and Facility Security Clearance through the Defense Security Service shall process the NACs and forward visit requests/results of NAC to the Fort Worth District Security Officer. For those contractors that do not have a CAGE Code or Facility Security Clearance, the Fort Worth District Security Office will process the investigation in coordination with the Contractor and contract employees.

In accordance with Engineering Regulation, ER 380-1-18, Section 4, foreign nationals who work on Corps of Engineers' contracts or task orders shall be approved by the HQUSACE Foreign Disclosure Officer or higher before beginning work on the contract/task order. This regulation includes subcontractor employees. (NOTE: exceptions to the above requirement include foreign nationals who perform janitorial and/or ground maintenance services.) The contractor shall submit to the Division/District Contract Office, the names of all foreign nationals proposed for performance under this contract/task order, along with documentation to verify that he/she was legally admitted into the United States and has authority to work and/or go to school in the US. Such documentation may include a US passport, Certificate of US citizenship (INS Form N-560 or N-561), Certificate of Naturalization (INS Form N-550 or N-570), foreign passport with I-551 stamp or attached INS Form I-94 indicating employment authorization, Alien Registration Receipt Card with photograph (INS Form I-151 or I-551), Temporary Resident Card (INS Form I-688), Employment Authorization Card (INS Form I-688A), Reentry Permit (INS Form I-327), Refugee Travel Document (INS Form I-571), Employment Authorization Document issued by the INS which contains a photograph (INS Form I-688B).

Classified contracts require the issuance of a DD Form 254 (Department of Defense Contract Security Classification Specification).

LIMITATION OF PAYMENT FOR DESIGN

If it should be necessary to terminate this contract, for any reason, prior to completion, the Government will pay the Contractor a fair and reasonable price for the design services performed and delivered to the Government. However, such payment will not exceed a sum greater than the amount allowable under 10 USC 4540 regardless of the actual costs the Contractor may be able to substantiate.

(End of clause)

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00800-5

**Design-Build Miscellaneous
Construction, Renovation, &
Alternation Projects
Fort Hood, Texas**

DESIGN-BUILD CONTRACT-ORDER OF PRECEDENCE - AUG 1997

a. The contract includes the standard contract clauses and schedules current at the time of award. It also entails: (1) the solicitation in its entirety, including all drawings, cuts and illustrations, and any amendments during proposal evaluation and selection, and (2) the successful Offeror's accepted proposal. The Contract constitutes and defines the entire agreement between the Contractor and the Government. No documentation shall be omitted which in any way bears upon the terms of that agreement.

b. In the event of conflict or inconsistency between any of the provisions of the various portions of this contract, precedence shall be given in the following order:

1. The Solicitation, including all amendments (See also Contract Clause: SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION).

2. All other provisions of the accepted proposal.

3. Any design products, including but not limited to drawings, specifications, engineering studies and analyses, shop drawings, equipment installation drawings, etc. These are "deliverables" under the Contract and are not part of the Contract itself. Design products must conform to all provisions of the contract, in the order of precedence herein.

Failure of any of the reviews to identify a proposed level of quality of systems, equipment, or materials that does not meet the minimum criteria of the Request for Proposal documents does not relieve the Contractor of these requirements. Changes to Government-accepted, Contractor-approved deliverables (e.g. construction drawings and specifications) shall not be made without the Contracting Officer's knowledge and acceptance.

PROPOSED BETTERMENTS – AUG 1997

- a. The minimum requirements of the contract are identified in the Request for Proposal. All betterments offered in the proposal or the Government-accepted, Contractor-approved final (100%) construction documents become a requirement of the awarded contract, unless specifically excluded.
- b. "Betterment" is defined as any material, equipment, component, or system, which exceeds the minimum requirements, stated in the Request for Proposal. This includes all proposed betterments listed in accordance with the "Proposal Submission Requirements" of the Solicitation, and all Government identified betterments,

and those included on any of the Government-accepted, Contractor-approved final (100%) construction documents.

- c. "Government identified betterments" include the betterments identified on the "List of Accepted Project Betterments" prepared by the Proposal Evaluation Board and made part of the contract by alteration, and all other betterments identified in the accepted Proposal after award.

KEY PERSONNEL, SUBCONTRACTORS AND OUTSIDE ASSOCIATES OR CONSULTANTS –AUG 1997

In connection with the services covered by this contract, any in-house personnel, subcontractors, and outside associates or consultants will be limited to the individuals or firms that were specifically identified and agreed to during negotiations. The contractor shall obtain the Contracting Officer's written consent before making any substitution for these designated in-house personnel, subcontractors, associates, or consultants.

RESPONSIBILITY OF THE CONTRACTOR FOR DESIGN - FEB 2000

- a. The Contractor shall be responsible for the professional quality, technical accuracy, and the coordination of all designs, drawings, specifications, and other non-construction services furnished by the Contractor under this contract. The Contractor shall, without additional compensation, correct or revise any errors or deficiency in its designs, drawings, specifications, and other non-construction services and perform any necessary rework or modifications, including any damage to real or personal property, resulting from the design error or omission.
- b. Neither the Government's review, approval or acceptance of, nor payment for, the services required under this contract shall be construed to operate as a waiver of any rights under this contract or of any cause of action arising out of the performance of this contract. The Contractor shall be and remain liable to the Government in accordance with applicable law for all damages to the Government caused by the Contractor's negligent performance of any of these services furnished under this contract.
- c. The rights and remedies of the Government provided for under this contract are in addition to any other rights and remedies provided by law.
- d. If the Contractor is comprised of more than one legal entity, each entity shall be jointly and severally liable there under.

WARRANTY OF CONSTRUCTION WORK – AUG 1997

- a. In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.
- b. This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.
- c. The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of--

1. The Contractor's failure to conform to contract requirements; or
 2. Any defect of equipment, material, or workmanship.
- d. The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.
 - e. The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.
 - f. If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.
 - g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall--
 1. Obtain all warranties that would be given in normal commercial practice;
 2. Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and
 3. Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.
 - h. In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.
 - i. Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.
 - j. This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

GOVERNMENT-FURNISHED RFP DRAWINGS, SURVEYS AND SPECIFICATIONS – JUL 2001

- a. The Contractor shall--
 1. Check all Government-furnished drawings and surveys immediately upon receipt;
 2. Compare all drawings and verify the figures before laying out the work;
 3. Promptly notify the Contracting Officer of any discrepancies; and
 4. Be responsible for any errors that might have been avoided by complying with this paragraph.
- b. Large-scale drawings shall, in general, govern small-scale drawings. Figures marked on drawings shall, in general, be followed in preference to scale measurements.
- c. Omissions from the drawings or specifications or the mis-description of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or mis-described details of the work, but shall be performed as if fully and correctly set forth and described in the drawings and specifications.

d. The work shall conform to the specifications and the contract drawings identified as:

CRITERIA DRAWINGS AND SURVEYS	
Sequence No.	Title
1	The list of drawings and maps set out in the index on the drawings is hereby incorporated by reference into these specifications.
thru	
[...]	Schedules included in the drawings are for the purpose of defining requirements other than quantities.

SEQUENCE OF DESIGN-CONSTRUCTION - AUG 1997

- (a) ~~After receipt of the Contract Notice to Proceed (NTP) the contractor shall initiate design, comply with all design submission requirements as covered under Division 01 General Requirements, and obtain Government review of each submission. No construction may be started, (with the exception of _____) until the Government reviews the Final Design submission and determines it satisfactory for purposes of beginning construction. The ACO or COR will notify the Contractor when the design is cleared for construction. The Government will not grant any time extension for any design resubmittal required when, in the opinion of the ACO or COR, the initial submission failed to meet the minimum quality requirements as set forth in the Contract~~
- (b) ~~If the Government allows the Contractor to proceed with limited construction based on pending minor revisions to the reviewed Final Design submission, no payment will be made for any in-place construction related to the pending revisions until they are completed, resubmitted and are satisfactory to the Government.~~
- (c) ~~No payment will be made for any in place construction until all required submittals have been made, reviewed and are satisfactory to the Government.~~

CONSTRUCTOR'S ROLE DURING DESIGN – JUN 1998

The Contractor's construction management key personnel shall be actively involved during the design process to effectively integrate the design and construction requirements of this contract. In addition to the typical required construction activities, the constructor's involvement includes, but is not limited to actions such as: integrating the design schedule into the Master Schedule to maximize the effectiveness of fast-tracking design and construction (within the limits allowed in the contract), ensuring constructability and economy of the design, integrating the shop drawing and installation drawing process into the design, executing the material and equipment acquisition programs to meet critical schedules, effectively interfacing the construction QC program with the design QC program, and maintaining and providing the design team with accurate, up-to-date redline and as-built documentation. The Contractor shall require and manage the active involvement of key trade subcontractors in the above activities.

RECOMMENDED INSURANCE COVERAGE – JUL 2001

The Design-Build Contractor's attention is invited to the contract requirements concerning "RESPONSIBILITY OF THE CONTRACTOR FOR DESIGN" and "WARRANTY OF CONSTRUCTION WORK". These requirements vest in the Contractor complete responsibility for the professional quality, technical accuracy, and coordination of all design, drawings, specifications and other work or materials furnish by his in-house or consultant forces. The Design-Build Contractor must correct and revise any errors or deficiencies in his work, notwithstanding any review, approval, acceptance or payment by the Government. The Contractor must correct and change any work resulting from his defective design at no additional cost to the Government. The requirements further stipulate that the Design-Build Contractor shall be liable to the Government for the damages to the Government caused by negligent performance. Though not a mandatory requirement, this is to recommend that the Design-Build Contractor investigate and obtain appropriate insurance coverage for such liability protection.

VALUE ENGINEERING AFTER AWARD – JUNE 1999

- a. In reference to Contract Clause 52.248-3, "Value Engineering – Construction", the Government may refuse to entertain a "Value Engineering Change Proposal" (VECP) for those "performance oriented" aspects of the Solicitation documents which were addressed in the Contractor's accepted contract proposal and which were evaluated in competition with other offerors for award of this contract.
- b. The Government may consider a VECP for those "prescriptive" aspects of the Solicitation documents, not addressed in the Contractor's accepted contract proposal or addressed but evaluated only for minimum conformance with the Solicitation requirements.
- c. For purposes of this clause, the term "performance oriented" refers to those aspects of the design criteria or other contract requirements which allow the Offeror or Contractor certain latitude, choice of and flexibility to propose in its accepted contract offer a choice of design, technical approach, design solution, construction approach or other approach to fulfill the contract requirements. Such requirements generally tend to be expressed in terms of functions to be performed, performance required or essential physical characteristics, without dictating a specific process or specific design solution for achieving the desired result.
- d. In contrast, for purposes of this clause, the term "prescriptive" refers to those aspects of the design criteria or other Solicitation requirements wherein the Government expressed the design solution or other requirements in terms of specific materials, approaches, systems and/or processes to be used. Prescriptive aspects typically allow the Offerors little or no freedom in the choice of design approach, materials, fabrication techniques, methods of installation or other approach to fulfill the contract requirements.

SUBMITTAL OF WORK TO BE PERFORMED BY THE CONTRACTOR – JUL 2001

The Contractor shall furnish the Contracting Officer within 10 days after the award the items of work he will perform with his own forces and the estimated cost of those items. The percentage of work that must be performed by the Contractor is stated in the clause entitled, "Performance of Work by the Contractor."

DESIGN CONFERENCES - AUG 1997

Pre-Work: As part of the Pre-work Conference conducted after contract award, key representatives of the Government and the Contactor will review the design submission and review procedures specified herein, discuss the preliminary design schedule and provisions for phase completion of the D/B documents with construction activities, (fast tracking), as appropriate, meet with Corps of Engineers Design Review personnel and key Using Agency points of contact and any other appropriate pre-design discussion items.

Initial Design Conference: After award of the contract, the Contractor shall visit the site and conduct extensive interviews, and problem solving discussions wit the individual users, base personnel, Corps of Engineers personnel to acquire all necessary site information, review user operations, and discuss user needs. The Contractor shall document all discussions. The design shall be finalized as direct result of these meetings.

Design Review Conferences: Review conferences will be held on base for each design for each submittal. The Contractor shall bring the personnel that developed the design submittal to the review conference. The conferences will take place the week after the review is complete.

(End of Clause)

PROTECTION OF MATERIAL AND WORK – AUG 1997

The Contractor shall at all times protect and preserve all materials, supplies and equipment of every description (including property which may be Government-furnished or owned) and all work performed. All reasonable requests of the Contracting Officer to enclose or specially protect such property shall be complied with. If, as determined by the Contracting Officer, material, equipment, supplies, and work performed are not adequately protected by the contractor, the Government may protect such property and the cost thereof may be charged to the contractor or deducted from any payment due him.

CONTRACTOR'S FINAL (100%) CONSTRUCTION DOCUMENTS

The drawings and specifications referred to in the third sentence of Contract Clause 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, subparagraph (a), are those drawings and specifications furnished with the Solicitation; this reference does not apply to the accepted Contractor's final (100%) construction documents. Therefore, in addition to this requirement, the Contractor shall keep at the work site a copy of the accepted Contractor's Final (100%) Construction Documents (drawings and specifications, including schedules and color boards) and a complete set of the Contract Documents. The Contractor shall at all times give the Contracting Officer access to these documents as well.

APPROVAL OF MACHINERY AND EQUIPMENT

Reference to Contracting Officer's approval of "machinery and mechanical and other equipment to be incorporated into the work" in Contract Clause 52.236-5 MATERIAL AND WORKMANSHIP, paragraph (b), applies only to machinery and equipment specified in the Solicitation documents.

(End of Section 00800)

ACCOMPANYING AMENDMENT NO. 0002 TO SOLICITATION NO. W9126G-04-R-0046

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SECTION 01010

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19. WATER DISTRIBUTION
20. SANITARY SEWER
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22. SITE GRADING

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- 23. FOUNDATION AND GEOTECHNICAL DESIGN
 - 24. LANDSCAPE DESIGN
 - 25. IRRIGATION SYSTEM
 - 26. ARCHITECTURAL DESIGN REQUIREMENTS
 - 27. STRUCTURAL INTERIOR DESIGN (SID)
 - 28. COMPREHENSIVE INTERIOR DESIGN (CID)
 - 29. STRUCTURAL DESIGN REQUIREMENTS
 - 30. (AM #0002) GENERAL PLUMBING DESIGN REQUIREMENTS
 - 31. FIRE PROTECTION
 - 32. (AM #0002) GENERAL HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS
 - 33. INTERIOR ELECTRICAL DESIGN
 - 34. SITE ELECTRICAL DESIGN
 - 35. (AM #0002) NOT USED ~~STORAGE BUILDING (17000 BLOCK)~~
 - 36. (AM #0002) NOT USED ~~CLASSROOM BUILDING (16000 BLOCK)~~
 - 37. READY FOR OCCUPANCY
- (AM #0002) ATTACHMENT: PIPE BOLLARD DETAIL

-- End of Section Table of Contents --

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SECTION 01010

GENERAL PROJECT DESCRIPTION AND DESIGN REQUIREMENTS
AMENDMENT NO. 0002

1. GENERAL

1.1 The Contractor shall design and construct the Design-Build Miscellaneous Construction, Renovation, & Alteration Projects at Fort Hood, Texas resulting in complete and useable facilities.

1.2 Scope of Work

1.2.1 Renovations

The design and construction for the renovation of 45 existing buildings as outlined in following documents. Scope of renovations varies from minor refurbishing to complete building restoration in accordance with current safety, fire, and anti-terrorism force protection standards, as further described in the following documents.

1.2.2 Site Improvements

Site improvements include the design and construction of roadways, parking, and hardstand areas both as repair of existing and new construction. Design and construction covers clearing and grubbing, aggregate base course, bituminous base course, asphalt surface overlays, concrete hardstand, pavement markings, traffic control signage, sidewalks, storm drainage, area lighting, security fencing, and erosion control.

1.2.3 New Facility Construction

(AM#2) New Construction includes The design and construction of both relocatable and permanent structures **(AM#2) for** ~~to provide~~ administration, classroom, storage, and maintenance **(AM#2) use facilities.** The buildings shall be complete with water, sewer, electrical, gas service, fire alarm systems, **(AM#2) fire suppressions systems, and** communication and information systems **(AM#2) as required and** as further detailed in the following documents. The scope also includes utility design for sewer, water, gas, and electric from the point of connection to the identified facilities. Supporting facilities will include site related hardstand and pavement repair and construction, security fencing and lighting, sidewalks, storm drainage, and erosion control measures.

1.2.4 Furnishings

The interior design, procurement, and installation of furnishings for renovated and newly constructed buildings as further detailed in this RFP.

1.2.5 Personal Property Relocation

The scope of this Contract includes the packing, transporting, and unpacking of various personal property items involved in the relocation of approximately 3000 personnel with approximately 1500 pounds of property per person. Transport distances of up to twenty miles are to be anticipated. Contractor will be responsible for video taped documentation of property condition at pick-up and delivery points, preparation of property inventory, and liability insurance to cover loss and damage.

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1.3 Site locations

Specific project locations are shown on the site location drawings C-01 and C-02 or identified by Fort Hood building number.

1.4 Site Development and Utilities

Site development will include all clearing and grubbing and grading, pavement repairs, storm drainage, and utilities to support the facilities. Rudimentary drawings included in this RFP include site locations with the approximate site layout indicated and the proposed scope of work indicated. These drawings are included for design and coordination purposes **(AM#2) only. It is the Contractor's responsibility to develop complete site designs as needed to construct the project.** Further development of this design will require coordination with the using agency and base personnel. Revisions and refinements to these rudimentary drawings, or any other drawings and plans developed as a result of this proposal, should be expected during the course of design development until final design is achieved.

1.5 Demolition

Demolition will be as specified for each individual project site. Demolition for some building renovations involves hazardous material abatement as detailed further in the documents specific to those facilities. **(AM #0002) For submittal of a non-hazardous solid waste disposal plan, reference Section 01355 ENVIRONMENTAL PROTECTION, paragraph 1.7.2 Content, and a Waste Diversion Report reference SECTION 01572 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT and the Fort Hood Environmental Standard Operating Procedures (IMMU-SOP) in Section 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD.**

1.6 Army Standard Designs

There are no Army Standard Designs for this project.

2. DESIGN CRITERIA

2.1 Codes, reference documents and criteria referenced within this RFP, although not attached, are an integral part of this RFP. Each offeror is responsible for securing any necessary reference at the Offeror's own expense and resources. Requirements of this RFP may delete, revise, add to, or substitute for criteria contained in the referenced documents and this RFP shall be deemed the controlling authority of any changes to referenced documents and criteria.

2.2 Information provided in the appendices is intended to provide additional design requirements and information.

2.3 Concept Layout Drawings

Concept layout (one-line) drawings are included for design and coordination purposes. Further development of this design will require coordination with the using agency and base personnel. Revisions and refinements to these concept drawings, or any other drawings and plans developed as a result of this proposal, should be expected during the course of design development until final design is achieved.

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3. SPECIFICATION INTENT

The intent of these RFP specification sections is to describe the requirements for quality, function, and materials, and types of construction in sufficient detail to enable engineering and design to be completed by the Contractor. In this specification section, each engineering and design discipline describes design intent and outlines the parameters to which the Contractor shall design.

4. COORDINATION

4.1 The Contractor is responsible for the coordination between design, engineering, and construction disciplines in order to fulfill the requirements of this contract and to provide for a complete, integrated and functional design.

4.2 On-Site Design

The Contractor shall provide on-site design staff and perform design preparation on-site to the maximum extent possible to facilitate communications between the using agencies, the Contracting Officer's Representatives, and the Contractor's construction forces.

5. SUBMITTALS AND DESIGN REVIEW

Design review and approval under this Contract shall be managed on a fast-track basis. Each design submission must be complete and legible to facilitate review and approval. Design points of contact and locations for document delivery will be established at the pre-construction meeting. See Section 01012 DESIGN AFTER AWARD.

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Shop Drawings

Shop drawings shall be provided with design submissions for simultaneous review with the proposed design.

SD-03 Product Data

Product Data

Product data to help describe facilities, systems, and equipment shall be provided with design submissions.

SD-04 Samples

SID and CID; G

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SID and CID submittals, as described in this Section and in Section 01016 DESIGN DOCUMENT REQUIREMENTS, and including but not limited to color/finish sample boards, shall be part of the design submissions.

SD-05 Design Data

Design Data

Submit all design calculations, mix designs, analyses, surveys, and geotechnical reports as developed during design to the Central Texas Area Office. Provide design calculations signed and stamped by a registered structural or geotechnical engineer as appropriate demonstrating that foundations provided for each building will meet the requirements of the Contract.

SD-06 Test Reports

Test Reports

Submit all test reports applicable to the project to the Central Texas Area Office.

SD-07 Certificates

Certificates

(AM #0002) Buy American Act Certification

Asbestos-Free Construction Material (AM #0002) (listed in paragraph Asbestos Construction Materials)

Builders Hardware and Keying Schedules

(AM #0002) Low-Emitting and Non-hazardous Construction Materials (see paragraph Low-Emitting and Non-hazardous Construction Materials)

Submit all certifications applicable to the project. Provide a letter of certification signed and stamped by a registered structural engineer indicating that each individual building meets the structural provisions of the criteria specified in this Contract.

SD-09 Manufacturer's Field Reports

Field Reports

Submit all field reports applicable to the project to the Central Texas Area Office.

SD-10 Operation and Maintenance Data

Operation and Maintenance Data

Submit operation and maintenance data for all appliances and equipment. Assemble in separate binders by building number (i.e. one binder for all barracks is acceptable if appliances and equipment are the same for all barracks).

6. CONSTRUCTION ELEMENTS AND PRODUCTS

Furnish elements, assemblies, materials, and products that comply with the Contract requirements so that the finished facilities perform as specified. The actual construction shall comply with the specified requirements and may,

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at the Government's discretion, be examined, inspected, or tested to determine compliance. Furnish submittals during the design phases and during construction as specified below. See Division 1 Sections 01012 DESIGN REQUIREMENTS AFTER AWARD and 01330 CONSTRUCTION SUBMITTAL PROCEDURES for submittal requirements and definitions of "approved" and "accepted" submittals.

Materials, products, and assemblies shall conform to the Contract Specifications. Select in accordance with the following:

a. Where a product is specified only by a manufacturer name and model number/brand name, select in accordance with the Contract Clause 52.236-5 MATERIAL AND WORKMANSHIP. If the Buy American Act is specifically exempted for this product, use only that model/brand product.

b. Where the properties of a product are specified by description and/or with performance criteria, use products that comply with the description and/or performance criteria.

c. Where multiple manufacturers are listed for a particular product, use a product made by one of those manufacturers or any other manufacturer in accordance with the Contract Clause 52.236-5 MATERIAL AND WORKMANSHIP.

d. Where assemblies, products, types of products, or performance criteria are not specified, use products and assemblies that will perform well within the specified life span of the building. Furnish manufacturers' product literature, shop drawings, test reports, and/or certifications as required to verify the products meet Contract requirements.

e. Buy American Act: Furnish a separate certificate of compliance attesting that builders' hardware items and other products conform to the Section 00700 Contract clauses pertaining to the Buy American Act.

f. Gypsum Board Products: Submit certification that gypsum board products, such as gypsum wallboard, gypsum backing board, cementitious backer units, and joint treating materials do not contain asbestos.

g. Submit Certificates of Proof on construction products, such as sealants and joint compounds, are free of asbestos-containing materials.

h. Builders' Hardware:

(1) All hardware, including hinges, closers, locksets, exit devices, door hold open devices, and door stops, shall be grade 1 in accordance with the Builders Hardware Manufacturers Association ANSI/BHMA Standards. Pins on the closer arms shall not be removable except with a tool.

(2) Lock Trim: Lock trim shall be cast, forged, or heavy wrought construction of commercial plain design. In addition to meeting the test requirement of BHMA A156.13, knobs, lever handles, roses, and escutcheons shall be 0.050 inch (1.27mm) thick, if unreinforced. If reinforced, the outer shell shall be 0.035 inch (0.89 mm) thick and the combined thickness shall be 0.070 inch (1.78 mm) except that knob shanks shall be 0.060 inch (1.52 mm) thick. Knob diameter shall be 2-1/8 to 2-1/4 inches (54 to 57 mm). Lever handles shall be of plain design with ends returned to no more than 1/2 inch (10 mm) from the door face.

(3) Lock Cylinders and Cores (Mortise, Rim and Bored)

(a) Lock cylinders shall comply with BHMA A156.5. Lock cylinder shall have not less than seven pins.

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(b) Locks and cylinders shall have key removable type cores matching the keying system of the existing building.

(c) Disassembly of knob or lockset shall not be required to remove core from lockset.

(d) All locksets, lockable exit devices, and padlocks shall accept the same interchangeable cores.

(e) Provide a master keying system.

(f) Provide a construction master keying system.

(1) Furnish with construction interchangeable cores.

(2) Use the manufacturer's standard construction key system.

(g) Keying: Locks shall be keyed in sets or subsets. Change keys for locks shall be stamped with change number and the inscription "U.S. Property - Do Not Duplicate." The keys shall be furnished to the Contracting Officer arranged in a container in sets or subsets as scheduled.

(1) Keys shall be supplied as follows:

(2) Locks: 5 change keys each lock.

(3) Master keyed sets: 3 keys each set, where required.

(4) Control keys: [6][_] total.

(5) Construction keys: 6 total.

(6) Blank keys: 50 per key blank.

(4) During construction, furnish:

(a) Hardware and Accessories: Manufacturer's descriptive data, technical literature, catalog cuts, and installation instructions. Spare parts data for locksets, exit devices, closers, electric locks, electric strikes, electro-magnetic closer holder release devices, and electric exit devices, after approval of the detail drawings, and not later than 3 months prior to the date of beneficial occupancy. The data shall include a complete list of parts and supplies, with current unit prices and source of supply.

(b) Hardware Schedule: Hardware schedule listing all items to be furnished. The schedule shall include for each item: the quantities; manufacturer's name and catalog numbers; the ANSI number specified, sizes; detail information or catalog cuts; finishes; door and frame size and materials; location and hardware set identification cross-references to drawings; lock trim material thicknesses; lock trim material evaluation test results; corresponding reference standard type number or function number from manufacturer's catalog if not covered by ANSI or BHMA; and list of abbreviations and template numbers.

(c) Keying Schedule: Keying schedule developed in accordance with DHI Keying Systems, after the keying meeting with the user.

(d) Certificates of Compliance: The hardware manufacturer's certificates of compliance stating that the supplied material or hardware item meets specified requirements. Each certificate shall be signed by an official authorized to certify in behalf of the product manufacturer and shall identify quantity and date or dates of shipment or delivery to which the certificates apply. A statement that the proposed hardware items appear in BHMA L & R Directory, BHMA Closer Directory and BHMA Exit Devices Directory directories of certified products may be submitted in lieu of certificates.

7. DESIGN REQUIREMENTS

7.1 General

7.1.1 All work under this Contract shall be designed and constructed in accordance with the criteria contained herein using industry standard materials and efficient practices. The Contractor shall use materials and equipment allowed under the criteria cited in this Contract or acceptable

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under commercial standard practice where no specific criteria is provided. The building design and the materials selected shall be of high quality, durable, and easily maintained.

7.1.2 The Contractor shall prepare complete construction documents for all work designed as required by the Contract. The Contractor's Designers of Record shall develop construction document technical specifications for all areas of work. See Sections 01012 DESIGN AFTER AWARD and 01016 DESIGN DOCUMENT REQUIREMENTS.

7.1.3 The Contractor shall be responsible for the professional quality, code compliance, technical accuracy, and coordination of all designs, drawings, specifications and other documents or publications upon which the design and construction are based. See Section 01012 DESIGN AFTER AWARD for additional requirements.

8. DESIGN AND TECHNICAL CRITERIA

All designs and construction document drawings and specifications shall be prepared to comply with the Contract Documents. Deviations from the criteria will not be allowed unless prior approval is obtained from the Contracting Officer. All questions or problems encountered by the Contractor in the criteria shall be promptly submitted with recommendations to the Contracting Officer for approval.

8.1 ENGLISH OR METRIC DESIGN

The design shall be developed using English units of measure.

9. BUILDING CODES AND STANDARDS

Make all portions of the project comply with all applicable local, State, and Federal codes and regulations, including those listed below. This list is not intended to be a complete list. The "authority having jurisdiction," as cited in codes, standards, or references will be the Contracting Officer.

9.1 Conflict and Inconsistencies

In the event of conflict and inconsistency between any of the provisions of the various codes, standards, or references, precedence shall be given in the following order:

a) Contract requirements

1) The code, standard, or reference that is listed in the Contract design or performance requirement;

2) When conflict exists between references, the more stringent requirement shall govern;

3) Where a particular design aspect is not covered by any of the codes, standards, or references listed, nor by the requirements specified in the Contract, the Contractor shall be guided by other nationally recognized and accepted codes or standards which do apply;

b) Fort Hood Installation Design Guide and Technical Supplement to the Design Guide for Fort Hood.

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c) Southwestern Division's Architectural and Engineering Instructions Manual (AEIM)

d) Technical and Engineering Manuals, Instructions, Letters, Design Guides, Engineer Regulations, Pamphlets, and Bulletins.

e) Industry Standards and Regulations

9.2 Federal Regulatory Requirements

a) Public Law (P.L.) 91-190, National Environmental Policy Act, as amended 1969 (See additional Federal Regulation references in Chapter XII ENVIRONMENTAL DESIGN of COE SWD-AEIM (item H), Volume IV ATTACHMENTS.

b) 29 CFR 1910 Occupational Safety and Health Standards (AM #0002), 29 CFR 1926 Safety and Health Regulations for Construction, and other references as stated in SECTIONS 13280 ASBESTOS ABATEMENT, 13282 METALS ENCOUNTERED IN PAINT DUST DURING CONSTRUCTION, and 13284 REMOVAL, RECYCLING AND DISPOSAL OF REGULATED MATERIALS.

c) P.L. 93-205, Endangered Species Act, as amended 1973

d) UFC 3-600-01 Design: Fire Protection Engineering For Facilities

e) U.S. Environmental Protection Agency (EPA), National Pollution Discharge Elimination System (NPDES) Storm Water Construction Permit in accordance with Federal register, Volume 63, Number 128, July 6, 1998.

f) Not Used.

f) P.L. 95-515, National Historic Preservation Act, as amended 1980.

g) P.L. 96-95, Archaeological Resources Protection Act of 1979.

h) Executive Order (E.O.) 11593, Protection and Enhancement of the Cultural Environment.

i) E.O. 11990, Protection of Wetlands.

j) Clean Air Act, as amended 1990.

k) Clean Water Act, as amended 1990.

l) Oil Pollution Act, 1990 and 40 CFR Part 112, Oil Pollution Prevention and Response.

m) 40 CFR Part 82, Protection of Stratospheric Ozone.

n) 42 CFR Part 116, Emergency Planning and Community Right-To-Know

o) Pollution Prevention Act of 1990.

p) Resource Conservation Recovery Act, as amended 1986.

q) DoD Anti-Terrorism/Force Protection Minimum Standards

r) (AM #0002) TI 809-29, Structural Considerations for Metal Roofing (Aug.

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- s) (AM #0002) TI 809-07, Design of Cold-Formed Load Bearing Steel Systems and Masonry Veneer/Steel Stud Walls (Nov. 98)
- t) (AM #0002) TI 809-04, Seismic Design for Buildings (Dec. 98)
- u) (AM#2) TI 809-02, Structural Design Criteria for Buildings (Sept. 99)
- v) (AM#2) UFC 1-200-01, General Building Requirements (July 02)
- w) (AM #0002) UFC 3-310-01, Load Assumptions for Buildings (Aug. 98)

9.3 State of Texas regulatory requirements, (AM #0002) Texas Commission on Environmental Quality (TCEQ) ~~Texas Natural Resource Conservation Commission (TNRCC)~~

a) Air emission in accordance with 30 Texas Administrative Code (TAC) 116.111 and 30 TAC 106

b) Underground and Aboveground Storage Tanks per 30 TAC 334

c) Erosion and sedimentation control regulations, see Texas Pollutant Discharge Elimination System (TPDES) (AM #0002) ~~Construction~~ Storm Water (AM #0002) Construction General Permit TXR 150000 and Section 01421 OUTLINE OF A BASIC STORM WATER POLLUTION PREVENTION PLAN, Volume III SPECIFICATIONS.

d) (AM #0002) Water distribution systems in accordance with 30 TAC 290.44; disinfection of new and repaired water distribution facilities in accordance with 30 TAC 290.44 and 290.46; and customer service inspections in accordance with 30 TAC 290.46 and 290.47.

e) (AM #0002) Design criteria for sewerage systems in accordance with 30 TAC 317, especially 317.2 on sewerage collection systems and 317.3 on lift stations.

9.4 Non-Regulatory Criteria Documents

In addition to specific regulatory requirements, the following documents are also incorporated into the definition of "the code" for the purposes of this project, except for administrative provisions contained therein; where referenced, the role of the code official described in the document will be performed by Government.

- a) NFPA 10, Portable Extinguishers
- b) NFPA 70, National Electrical Code.
- c) NFPA 80, Fire, Doors and Windows
- d) NFPA 101, Safety to Life From Fire in Buildings and Structures.
- e) ICC 867 ICC International Fire Code.
- f) ICC 861 ICC International Building Code.

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- g) ICC 863 ICC International Plumbing Code.
- h) ICC 865 ICC International Mechanical Code.
- i) ICC 871 ICC International Fuel Gas Code.
- j) Army Regulation (AR) 200-1, Environmental Protection and Enhancement, February 1997.
- k) Army Regulation (AR) 200-2.1) Department of Defense, Directive 4120-14, Environmental Pollution Prevention Control and Abatement, August 1977.

1) (AM#2) NFPA 72 National Fire Alarm Code.

m) (AM#2) NFPA 13 Sprinkler Systems.

10. GENERAL CONSTRUCTION REQUIREMENTS

10.1 Government-Furnished Government-Installed Equipment (GFGI)

There is no GFGI in this Contract.

10.2 Government-Furnished Contractor Installed Equipment (GFCI)

There is no GFCI in this contract.

11. SITE CONDITIONS AND REQUIREMENTS

Prior to the commencement of construction, the Contractor and Contracting Officer shall inspect and record the existing conditions of the haul routes. The Contractor shall repair damaged haul routes to pre-construction conditions at the completion of construction and at no additional costs to the Government.

11.1 Project Limits

The Contractor shall confine all work to within the project limits identified on the drawings, unless directed otherwise or approved by the Contracting Officer. Locations of project sites and scope of work for each site are shown on the drawings.

11.2 National Environmental Policy Act (NEPA)

In compliance with the NEPA of 1969, as amended, the Environmental Assessment (EA) and Finding of No Significant Impact (FNSI) for the Transformation to Modular Brigades and Constructing Support Facilities at Fort Hood, Texas is available at the following link:

<http://www.dpw.hood.army.mil/HTML/PPD/Pnotice.htm>

(AM #0002) The Contractor shall verify the requirement of Clean Water Act Section 404 permit for expansion of existing sites and construction of new sites. If a Section 404 permit is required, it shall be obtained from the Regulatory Branch (PER-R), U.S. Army Corps of Engineers. Reference Fort Hood Environmental Compliance Actions Checklist attached to SECTION 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD.

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11.2.1 Environmental Protection Plan (EPP)

The Contractor shall prepare an EPP to discuss environmental concerns for both construction and operation of the finished facilities. The Contractor shall submit the EPP at the initial design submittals after contract award. The EPP shall be prepared in accordance with requirements stated in SECTION 01355 **(AM #0002) ENVIRONMENTAL PROTECTION and the Fort Hood Environmental Compliance Action Checklist and Environmental Standard Operating Procedures (IMMU SOP) attached to SECTION 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD.**

11.2.1.1 Pre-Treatment and Spill Prevention, Control, and Countermeasures (SPCC)

The Contractor shall determine if operation of the finished facilities require pre-treatment system or containment structures. The finished facilities may require pre-treatment of the industrial **(AM #0002) wastewater discharge (i.e. oil water separator at a vehicle maintenance shop), or provide a design that has zero industrial wastewater discharges as a design preference. Secondary waste discharge (i.e. oil water separator at a vehicle maintenance shop) and a secondary** containment with 110 percent capacity for regulated material storage **(Am #0002) may be required for** in compliance with the SPCC per 40 CFR Part 112.

11.2.1.2 Asbestos-Free Construction Material

The Contractor shall provide certification from manufacture to verify construction materials (i.e. drywall, ceiling tile, floor tile, mastic, insulation materials, sealant, gasket, etc.) do not contain asbestos fibers.

11.2.1.3 Low-Emitting and Non-hazardous Construction Materials

Sealants, glues, mastics, PVC glues shall have a certificate stating that the materials meets the Item 5.C4 Low-Emitting Materials of the Sustainable Project Rating Tool (SPiRiT) requirements, U.S. Army Corp of Engineers. The paint system shall meet requirements stated in guide specification UFGS 09900 PAINTS AND COATINGS for limits on lead. The paint system shall not contain mercury, cadmium, mildewcide and insecticide. Preferential consideration shall be provided for products that meet the SCS-EPP-SP01-01 per guide specification UFGS 09900, paragraph 1.2 SUBMITTAL. Submittal of SSPC QP 1 Certification and MSDS is required. In accordance with the Consumer Product Safety Commission's safety standards, lead content is not to exceed 0.06 percent (600 ppm) by (dry) weight of the material's non-volatile content. Submit MSDS to verify light ballast or transformer do not contain PCB, TCB or DEHP (See SECTION 13284 for definition). Submit MSDS to verify no ozone depleting chemicals in the refrigerants. **(AM #0002) Provide copies of MSDS to Ms. Timi Dutchuk, DPW, Environmental Division's Hazardous Materials Program Manager, telephone 254/287-9718 to ensure that materials brought on post contain only authorized constituents.**

11.3 Regulated Material Management

The Contractor shall manage regulated materials in accordance with SECTION 13280 ASBESTOS ABATEMENT, SECTION 13284 REMOVAL, RECYCLING, AND DISPOSAL OF REGULATED MATERIALS **(AM # 0002), SECTION 13282 METALS ENCOUNTERED IN PAINT DUST DURING CONSTRUCTION, SECTION 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD, SECTION 01355 ENVIRONMENTAL PROTECTION.** Reference Regulated Materials Schedule appended herein for estimated quantities based on previous survey

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data and survey conducted in August. ~~(AM #0002) The Contractor shall verify quantities prior to renovation.~~ The Contractor shall submit a 10-day advance notification to Texas Department of Health (TDH) of each renovation structure prior to start work. The Contractor shall coordinate with Fort Hood Environmental and initiate this activity to avoid delay of project schedule. ~~If site demolition is required and asbestos cement (transite) pipes are encountered, the Contractor shall stop work and notify the COR immediately.~~ **(AM #0002) The Contractor shall verify all ACM quantities in each renovated structure, demolition structure and at each demolition site with the COR.** See the **(AM #0002) revised** Appendix REGULATED MATERIALS SCHEDULE.

11.3.1 Safety and Health

The Contractor shall implement safety and health requirements during project execution per SECTION 01525 SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS and all submittals in SECTION 01525 SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS shall be submitted in the initial design submittals after contract award. Worker exposure assessment shall be performed to protect workers, occupants, and environment during renovation of building structures per SECTION(s) 13280 and 13282 for asbestos abatement and paint disturbance.

11.3.1.1 Air Pollution Control System

The Contractor shall determine if brake maintenance service is needed for the vehicle maintenance shop, i.e. a HEPA vacuum filtration system shall be required. If touch-up paint and welding areas are required for the mission of the facility, those areas shall be forced ventilated.

11.3.1.2 Radiation Safety

The Contractor and the sub-contractor are responsible for obtaining clearance from the Radiation Safety Office on any equipment that contains radioactive materials or produces non-ionizing or ionizing radiation. Such equipment typically includes equipment for Soil Density Testing, Lead-Based Paint Analysis (x-ray fluorescent analyzer), etc.

11.4 Management of Excess Materials and Waste

The Contractor shall manage waste as specified in Section(s) 01355 ENVIRONMENTAL PROTECTION, 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD, 01572 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT, 13280 ASBESTOS ABATEMENT, ~~13282 LEAD IN CONSTRUCTION, and 13284 REMOVAL, RECYCLING AND DISPOSAL OF REGULATED MATERIALS~~ **(AM #0002) 13282 METALS ENCOUNTERED IN PAINT DUST DURING CONSTRUCTION, and 13284 REMOVAL, RECYCLING AND DISPOSAL OF REGULATED MATERIALS, and the Fort Hood Environmental Compliance Actions Checklist and Fort Hood Environmental Standard Operating Procedures (IMMU SOP) attached with SECTION 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD.**

11.5 Disposal of Waste Materials

See **(AM #0002) paragraph 11.4 "Management of Excess Materials and Waste" above** ~~Section 01355 ENVIRONMENTAL PROTECTION.~~

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11.6 Demolition and Removals

The Contractor shall be responsible for furnishing an independent topographic survey of the project sites, all line and grade surveys, and as-built surveys of the construction areas. The Contractor shall survey and stake out the project boundaries before starting work. The drawings provided in the RFP indicate existing conditions and locations of existing utilities. The information shown on the base utility maps is the most recent data. The Contractor shall field verify exact locations of all utility lines prior to performing any excavation operations. The Contractor may utilize the utilities during construction operations and may incorporate the utilities as part of the final project. If existing utilities are determined to be inadequate for construction operations or for incorporation into the final facility, they will be upgraded as part of the construction project. However, if the Contractor elects not to use the existing utilities, they will remain in place. The Contractor shall protect existing lines to remain from damage during excavation and compaction operations. Existing utilities that interfere with this project will be relocated. Underground utilities will be disconnected as specified in paragraph INSTALLATION REQUIREMENTS FOR EXISTING UTILITY DISCONNECTIONS. Ten working days notification to the State of Texas Department of Health for demolition or specific asbestos removal operations may be required.

11.7 Survey

Demolition will include clearing and grubbing, where required, scarifying of existing pavements, where indicated and site utilities, where needed. See specifications 02220 DEMOLITION and 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD ~~for additional demolition requirements. Cleared and grubbed material will be disposed of at the Fort Hood landfill.~~ **(AM #0002) For management of cleared and grubbed material, also reference Fort Hood Environmental Standard Operating Procedures (IMMU SOP).** All demolition debris shall be removed to the Fort Hood Municipal Solid Waste Landfill located at the intersection of Turkey Run and Clark Roads. Quantity shall be determined by Contractor at pre-bid site visit. All debris resulting from clearing and grubbing operations shall be taken to the on-post landfill unless prior approval has been granted by the DPW to waste material in a soil eroded area near the construction site(s). All waste delivered to the landfill will be inspected by the landfill operating Contractor for materials that are not authorized in the landfill. Trucks that contain unauthorized waste will be diverted for removal of the unauthorized material before being allowed to proceed to the working facility to deposit their load. The Contractor shall obtain permission from Fort Hood's Directorate of Public Works (DPW) to use the Post's landfill. Submit documentation granting permission and a completed landfill permit to the Contracting Officer prior to start of construction. Any concrete or asphalt rubble removed as a result of demolition or site improvements shall be transported and stockpiled ~~at the DPW yard located near the intersection of West Range Road and South Range Road or as directed within a 20 mile radius of the project sites. Refer to Section 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD for additional guidance and information.~~ **(AM #0002) per SECTION 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD, Fort Hood Environmental Standard Operating Procedures (IMMU SOP) and Environmental Compliance Actions Checklist. The stockpile location is within a 20-mile radius of the project sites.**

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11.8 (AM #0002) Remediation of pipe insulation with mold contamination

The insulation on the chilled water pipes in basements where there is signs of mold contamination shall be removed and replaced. The Contractor shall use a glove bag method to remove the insulation. Removal shall be at least 2 inches beyond any visible contamination. Once removed the gloved bagged material can be disposed of with regular construction debris.

12. (AM #0002) STORM WATER POLLUTION PREVENTION PLAN ~~—SITE DESIGN AND CONSTRUCTION~~

(AM #0002) The Contractor shall prepare and submit Storm water Pollution Prevention Plan in accordance with all requirements of TPDES General Permit No. TXR 150000. The Contractor shall be responsible for preparing, signing, and submitting the Notice of Intent and Notice of Termination documents to the State of Texas, and to the DPW Environmental Division. ~~The Contractor shall prepare and submit an erosion control plan and obtain the erosion control permit. The Contractor shall be responsible for preparing, signing, and submitting the Notice of Intent and Notice of Termination documents to the State of Texas.~~

12.1 Storm Water Pollution Prevention

12.1.1 General

A Storm Water Pollution Prevention Plan (SWPPP) shall be submitted in the initial design submittals after contract award. The SWPPP shall be in compliance with the Texas Pollutant Discharge Elimination System (TPDES) **(AM 0002) General Permit** TXR No. 150000. Prepare SWPPP as specified in SECTION 01421 BASIC STORM WATER POLLUTION PREVENTION PLAN. One SWPPP shall cover all sites that require SWPPP (reference TXR 150000 for requirement) and provide separate description for each site that needs a SWPPP. To minimize the review and Contractor resubmittal process, the Contractor shall comply with all requirements stated in PART(s) 11 and 12 of SECTION 01421 **(AM #0002) and SWPPP should also clearly state who is the operator with operational control over plans and specifications and who is the operator with day-to-day operational control. The SWPPP should also identify the parties responsible for implementation of the best management practices or the erosion and sediment controls described in the plan.** The approved plan and items discussed in PART(s) 11 & 12 shall be on-site at all times for inspection by the Texas Commission on Environmental Quality (TCEQ) and installation Environmental office. All activities in SECTION 01421 BASIC STORM WATER POLLUTION PREVENTION PLAN and the approved Contractor SWPPP shall be implemented. The Contractor shall control erosion and sedimentation during construction at all sites, **(AM #0002)** ~~irregardless of the whether the site will require a SWPPP~~ (reference SECTION 01355 ENVIRONMENTAL PROTECTION. Sedimentation of adjacent sites or downstream ditches will not be permitted.

12.1.2 Notice Of Intent (NOI) and Notice Of Termination (NOT) Documents

The Contractor shall have knowledge of the large and small construction activity prior to submittal of NOI and NOT (reference TXR 150000 for definition and requirement for each site). The Contractor and Government shall separately submit a NOI to the Texas Commission on Environmental Quality (TCEQ). There is a 48-hour waiting period prior to site disturbance. The Contractor shall have an approved SWPPP prior to submit the NOI. The

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Contractor shall comply with PART 11 of SECTION 01421 prior to disturb any site. (AM #0002) TCEQ may require a separate NOI and NOT for each site.

12.1.3 Erosion and Sediment Control

(AM #0002) The Contractor shall be responsible to design erosion and sediment control features, such as control structures described in SECTION 01421 and if attainable, a detention pond to retain sediment on site and to minimize erosion downstream of the site. Erosion controls are preferred to sediment controls because they minimize or prevent the movement of sediment, reducing maintenance requirements and the likelihood that excessive pollutants in the construction site runoff. If it is necessary to use a temporary containment structure, it can become a permanent storm water management feature, depending on site-specific storm runoff issues at the finished site. Per TXR 15000, temporary sediment basin are required when feasible for common drainage locations that serve an area with 10 or more acres disturbed at one time. The basin shall provide storage for a calculated volume of runoff from a 2-year, 24-hour storm from each disturbed acre drained. The storm runoff calculation shall be in accordance with paragraph SITE DESIGN AND CONSTRUCTION.

~~The Contractor shall be responsible to design erosion and sediment control features, i.e. detention pond to retain the increase runoff and sediment from the site and to minimize erosion downstream of the site. The temporary containment structure shall receive the final grade and become the permanent storm water management feature for the storm runoff at the finished site. Per TPDES TXR No.15000, the temporary (or permanent) sediment basin are required when feasible for common drainage locations that serve an area with 10 or more acres disturbed at one time, the basin provides storage for a calculated volume of runoff from a 2 year, 24 hour storm from each disturbed acre drained. The storm runoff calculation shall be in accordance with the applicable Storm drainage USACE Technical Manual.~~

13. SITE DESIGN AND CONSTRUCTION

13.1 References

The site design for the support facilities shall comply with the requirements of the applicable parts of the following references:

CESWD Architectural and Engineering Instruction Manual (CESWD-AEIM)

Uniform Federal Accessibility Standards, Federal Register (UFAS)

Americans with Disabilities Act Guidelines (ADA)

TM 5-803-5, Installation Design

TM 5-803-14, Site Planning and Design

TM 5-813-5, Water Supply, Water Distribution Systems

TM 5-814-1, Sanitary and Industrial Wastewater Collection- Gravity Sewers and Appurtenances

TM 5-814-2, Sanitary and Industrial Wastewater Collection- Pumping Stations and Force Mains

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TM 5-820-4, Drainage for Areas Other Than Airfields

TM 5-822-2, General Provisions and Geometric Design for Roads, Streets, Walks, and Open Storage Areas

TM 5-822-5, Pavement Design for Roads, Streets, Walks, and Open Storage Areas

TM 5-848-1, Gas Distribution

DG 1110-3-204, Design Guide for Army and Air Force Airfields, Pavements, Railroads, Storm Drainage, and Earthwork

(AM#2) ~~MIL-HDBK 1008A, Fire Protection for Facilities~~

(AM#2) UFC 3-600-1, Fire Protection Engineering for Facilities

(AM#2) UFC 3-420-01FA, Plumbing

MIL-HDBK-1190, Facility Planning and Design Guide

HQUSACE Architectural and Engineering Instructions- Design Criteria
(USACE AEI)

UFC 4-010-01, October 2003, DOD Minimum Antiterrorism Standards for Buildings

(AM #0002) UFC 3-260-01, Airfield and Heliport Planning and Design

Fort Hood Installation Design Guide and the Technical Supplement

Site design shall be in accordance with the Fort Hood Installation Design Guide and Technical Supplement, as well as the references listed above. The construction limits shown on the drawings are approximate. The Contractor shall coordinate exact limits with the Contracting Officer.

13.2 Site Specifications

Army Corps of Engineers guide specifications shall be used by the designer for design and construction. The following site related guide specifications shall be edited, as required for the design and construction of the support facilities required for this project:

02220	DEMOLITION
02230	CLEARING AND GRUBBING
02300	EARTHWORK
02315	EXCAVATION, FILLING AND BACKFILLING FOR BUILDINGS
02316	EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS
02510	WATER DISTRIBUTION SYSTEM
02531	SANITARY SEWERS
02556	GAS DISTRIBUTION SYSTEM
02570	VALVE PITS AND PIPING AND EQUIPMENT IN VALVE PITS
02630	STORM-DRAINAGE SYSTEM
02713A	BITUMINOUS BASE COURSE
02722	AGGREGATE AND/OR GRADED-CRUSHED AGGREGATE BASE COURSE
02741A	HOT-MIX ASPHALT (HMA) FOR ROADS
02748	BITUMINOUS TACK AND PRIME COATS
02770	CONCRETE SIDEWALKS AND CURBS AND GUTTERS

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13.3 Erosion Control Plan

(AM #0002) A Storm Water Pollution Prevention Plan is required. See paragraphs "Storm Water Pollution Prevention" and "Erosion and Sediment Control."

~~A Storm water Pollution Prevention Plan is required. Silt fences, hay bale barriers and other storm water controls are required to prevent the movement of silt and other construction debris from the construction sites. The Contractor shall be responsible for preparing and submitting an erosion control plan. The Contractor shall be responsible for preparing, signing and submitting Notice of Intent and Notice of Termination documents to the State of Texas.~~

13.4 Site Constraints

13.4.1 The new project storm water system shall not impact the surrounding sites. Construction shall not impact the existing drainage system adjacent to the site.

13.4.2 Force Protection Setback Requirements

Buildings and parking areas shall be located on the site in accordance with the Unified Facilities Criteria, DOD Minimum Antiterrorism Standards for Buildings, UFC-4-010-01 (Oct 2003) (AM #0002) per Appendices B GEOTECHNICAL REPORT and C FORT HOOD INSTALLATION DESIGN GUIDE ~~for Expeditionary and Temporary Structures~~ and Security of Unclassified Army Property (Sensitive and Nonsensitive) AR 190-51. All mechanical and electrical equipment shall be located outside the unobstructed space.

13.5 Traffic Control

If new construction affects the flow of traffic, a Traffic Safety Plan using recommendations of Section VI of the Uniform Traffic Control Devices Manual (UTCDM) shall be followed. In addition to the UTCDM the Contractor must maintain 50% of traffic capacity at all times.

13.6 Contractor's Storage and Staging Area

The Contractor's Storage and Staging Area will be located (AM #0002) at each site. The specific location of staging and storage areas will be coordinated with the Contracting Officer ~~east of the parking area of Building 4622 (Army Corps of Engineers Central Texas Area Office) located on Engineer Drive, unless directed otherwise by the Contracting Officer.~~ The Contractor shall construct a temporary 6-foot high chain link fence around trailers and materials. Visibility through the fence shall be obstructed by cloth fabric attached to the fence fabric or by a method approved by the Contracting Officer. Trailers, materials, or equipment shall not be placed or stored outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer away from the vicinity of the construction site but within the military boundaries. Trailers, equipment, or materials shall not be open to public view with the exception of those items which are in support of ongoing work on any given day. Materials shall not be stockpiled outside the fence in preparation for the next day's work. Mobile equipment, such as tractors,

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wheeled lifting equipment, cranes, trucks, and like equipment, shall be parked within the fenced area at the end of each work day.

13.7 Construction Haul Route

The construction entrance will be off of Clarke Road north to Tank Destroyer Road. The specific haul routes for each of the site locations will be determined by the Contracting Officer at the Pre-construction conference.

14. DESIGN REQUIREMENTS FOR SITE CONSTRUCTION, UPGRADES AND REPAIRS

14.1 Pavement Upgrades and Repairs

Flexible pavement design and construction details shall be in accordance with TM 5-822-5 and CESWD-AEIM. Refer to the Appendix Government Geotechnical Report (Preliminary), for pavement sections and pavement material requirements.

14.2 Curb and Gutters

Provide curb and gutters at hardstands, where needed to control erosion from drainage. Curb and gutter shall be a 6-inch concrete curb and gutter 2 feet wide. All gradients shall provide positive drainage (no ponding). Curb cuts and concrete flumes shall be provided as necessary for pavement drainage. Riprap shall be provided from the edge of the concrete to drainage ditch bottom as required for erosion control purposes.

14.3 Fencing

As soon as practicable, but not later than 15 days after the date established for commencement of work, the Contractor shall furnish and erect temporary project safety fencing at the work sites. The Contractor must completely enclose construction areas and buildings to be demolished with chain link security fencing. The fence shall be 6 feet with three strands of barbed wire for a total of 7 feet. The safety fencing shall be 9 gage chain link fencing, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved locations. Do not include a top pipe rail. Chain link fence fabric shall be tied on the secure side of the fence using wire ties not clips. The safety fencing shall be maintained by the Contractor during the life of the contract and, upon completion and acceptance of the work, shall become the property of the Contractor and shall be removed from the work sites. ~~(AM#2) See paragraph 5.5 for additional fencing requirements.~~

TEMPORARY HAZARD SAFETY FENCING: The Contractor shall furnish and erect safety fencing at temporary hazards and work site areas considered to be hazardous to the public. The safety fencing shall be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 42 inches high, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved locations. The safety fencing shall be maintained by the Contractor during the life of the hazard and, upon completion and acceptance of the work, shall become the property of the Contractor and shall be removed from the work site.

14.4 Handicap Access

Ramps and sidewalks shall be provided for handicapped (HC) access to the to the applicable facilities. The number of designated parking spaces for the

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physically disabled shall be two spaces per facility and shall be designed in accordance with the Uniform Federal Accessibility Standards for ADA facilities. ~~Concrete sidewalks shall consist of 4" reinforced concrete on top of a 4" sand cushion. The sand cushion shall be compacted by two passes of a vibratory plate compactor. Minimum walk width shall be 6 feet. Sidewalks shall be reinforced with 6" X 6" W3 X W3 welded wire mesh.~~

(AM#2) 14.5 Side Walks

Concrete sidewalks shall consist of 4" reinforced concrete on top of a 4" sand cushion. The sand cushion shall be compacted by two passes of a vibratory plate compactor. Minimum walk width shall be 6 feet. Sidewalks shall be reinforced with 6" X 6"- W3 X W3 welded wire mesh.

Contraction joints shall be spaced at the width of the sidewalk on centers and expansion joints shall be placed at 40 feet on center and at the intersection of walks and curbs. Provide centerline contraction joints in walks wider than 8 feet, spaced at 6 feet maximum.

(AM #0002) 14.6 Bollards

Modular facilities shall be protected by bollards where collision hazards may exist. Provide steel bollards at maintenance bay doors, at fire hydrants, at POL storage tanks, and at any other locations where frequent vehicle access/egress increases the risk of damage by vehicle impact.

(AM #0002) 14.7 Building Orientation

Laundry and day room facilities should be centrally located to the barracks facilities. Arms rooms shall be sited in the vicinity of the Company Operations Facilities. Dumpsters shall be located behind facilities where possible. One dumpster pad shall be provided per 100 soldiers in the barracks complexes. Provide one dumpster at each of the maintenance shops, classroom, administration and unit storage facilities.

15. BORROW

Borrow material shall be selected to meet the requirements and conditions of the particular fill or embankment for which it is to be used. Borrow material shall be obtained from borrow areas (AM #0002) designated by the Installation. Borrow material shall initially be obtained from the IMMU per SECTION 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD. If sufficient material is not available from IMMU, or other on-post locations, obtain material from located off Government Controlled property and within 10 miles of the project site(s) and at the responsibility of the Contractor. Necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris thereon shall be considered related operations to the borrow excavation. Borrow pits shall be neatly trimmed and drained after the excavation is completed. Borrow materials shall be free of any contaminants.

16. UTILITY LAYOUT AND DESIGN

Coordination of all site work on the project, including utility work, is the responsibility of the Contractor. It is the Contractor's responsibility to confirm the specific locations of the existing utilities and to design and construct new utility services for the new buildings. All utilities necessary

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to service the new facilities are readily available within or along the perimeter of the project sites. Flow data for gas and water utilities in the area can be obtained from the Installation's DPW office and Fire Department. Electronic copies of the base utility maps for the project area will be furnished with the advertisement package. The Contractor shall provide a minimum of 1 week notice to the Installation's DPW office of any planned utility outages. The new facilities will be all electric except at the unit storage facility, where gas will be provided. See paragraph [SITE ELECTRICAL DESIGN](#) for site electrical requirements.

All utilities, including electrical service, telephone and cable TV, shall be installed underground. New underground utility lines, including appurtenant structures such as valve boxes, manholes, vaults, etc. shall not be located under pavements, road shoulders or drainage ditches to the maximum extent practicable. Unless otherwise approved by the Contracting Officer, placing utilities and culverts under existing roads shall be by jack and bore construction. Excavation of trenches, installation of lines and backfilling for utilities shall be in accordance with earthwork and grading requirements and conform to standard military construction practices. The bedding surface of the new pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe. All gravity flow lines of more than one manhole shall be profiled. Sections shall be provided for all culverts.

The Contractor shall obtain digging permits directly from the Fort Hood Post DPW before any drilling, digging or excavation is undertaken. Provide a completed form FHT 420-X10, Coordination for Land Excavation, to the DPW, Building 4612, Fort Hood, Texas for each permit required. The Contractor shall allow 24 hours for Government review of digging permit request. The Contractor shall apply immediately after contract award for the digging permit. Digging and/or excavation shall not start until approval of digging permit has been received. Permits will identify all underground utilities within 5 feet of the designated area. The Contractor is responsible for all repairs, costs and damages due to excavation without a permit or for damaging an identified utility. Unidentified utilities shall be repaired by the Contractor at Government expense.

16.1 Backflow prevention valves, post indicator valves, transformers, electric switches, telephone/cable boxes, manholes, irrigation pumps and controllers, etc. shall be located in locations not immediately apparent to the facility users or personnel passing by the site.

16.2 Marking Of Utility Lines

Utility lines shall be marked with plastic marking tape in accordance with the applicable paragraphs of specification sections 02510, 02531 and 02556.

16.2.1 Tracer Wire

In addition to the plastic marking tape, tracer wire shall also be provided for all new underground utilities, except sanitary sewer, in accordance with the applicable specification sections. Tracer wire shall be subject to approval by the Contracting Officer and shall be tested and proved continuous prior to final inspection.

16.3 Installation Requirements for Existing Utility Disconnections

16.3.1 References:

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- a. The National Standard Plumbing Code
- b. NSPC Standard
- c. **(AM #0002) TCEQ, 30 TAC 290 (Water); 30 TAC 317 (Sewer)** ~~TNRCC, 30 TAC 290 (Water)~~
- d. TXDOT Standards for Natural Gas

16.3.2 Water Line Disconnections

Existing water service lines, associated with older buildings to be demolished and other construction where required, shall be physically separated from, and capped or plugged at the water supply main at the first threaded connection closest to the main. Where the supply from the main feeds more than one building, and those remaining buildings will have continued water service, the Contractor shall physically separate, and cap or plug the water supply for the demolished building at the tee branch. Where demolished buildings have separate fire lines (typically 4"-8" diameters) for fire protection, the Contractor shall physically separate the fire line from the source main, between the operating valve and the main, and cap or plug the service lead as close as possible to the main. In all cases, if the materials of previous construction included leaded joint tees as the point of connection from the water main to the lines to be abandoned, the Contractor shall physically remove the main line tee and replace the portion of the main which was affected. **AM #0002 The water line "stub" shall be no longer than three feet from the active water main wherever possible and practicable. Exceptions to this requirement shall obtain approval from the Installation DPW Maintenance Division.** All valves and valve boxes associated with the utility lines to be abandoned shall be removed from the site and shall not be buried in place, unless there are other buildings that are affected by the same service line tap.

16.3.2.1 Replacement of Spoil Materials At Utility Excavations

Existing lines that are to remain in service and which are exposed during excavation shall have sand tamped in place around and under those utilities, and be brought to a height of at least 1 foot above the affected line. Changes to remaining utilities will be identified accurately by the Contractor and provided to the Contracting Officer for updates to base utility maps. **(AM #0002)** ~~Contractor shall sanitize/disinfect new materials that have to be installed to meet the above requirements. The Contractor shall provide Customer Service Inspection and include the required forms.~~

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(AM #0002) 16.3.2.2 Potable Water System Disinfection and Inspection
Procedures

The Contractor shall sanitize/disinfect in accordance with TCEQ standards for the new or repaired water distribution piping installed to meet the above requirements, or existing water distribution piping where the integrity of the system was compromised. Records of all disinfection procedures and bacteriological sampling results shall be maintained by the Contractor and copies of these documents shall be provided to the COR, and the Installation DPW Environmental Division no later than one week after the work is performed or sample results are obtained. New water mains shall be thoroughly disinfected in accordance with AWWA Standard C651 and then flushed and sampled before being placed in service. The Contractor shall provide a Customer Service Inspection where needed and submit the original Customer Service Inspection form to the DPW Environmental Division.

16.3.3 Sanitary Sewer Line Disconnections

Existing lateral sewer lines from the demolished buildings (typically 3"-8" diameters) shall be physically separated from the sewer collection system at the closest point to the receiving manhole, or branch wye if the lateral receives effluent from additional buildings that are to remain in service. The Contractor shall permanently cap or install a concrete plug or other Contracting Officer approved device permanently affixed to the remaining portion of the active sewer line that will prevent groundwater influence. All cleanouts and similar above ground fittings associated with sewer lines to be abandoned shall be physically separated from the lateral line at the fitting (wye) below grade and removed from the site.

16.3.4 Natural Gas Line Disconnections

Natural gas service lines shall be capped as near as possible to the source of supply and are typically either Polyethylene (PE) or steel. The Contractor shall heat fuse a PE cap in accordance with pipe manufacturer's recommendations or install a threaded plug or cap of approved material for steel lines as close to the tee as possible. The building riser shall be physically separated below grade at the depth of the service line and removed from the site(s). The abandoned service line shall be filled with water and each end shall be permanently capped or plugged, if the abandoned service line is not physically removed in its entirety from the original service line ditch. All associated service valves and valve boxes shall be physically removed from the site.

17. PERMITS

The Contractor shall determine permit requirements as part of the design process and shall secure all permits necessary for this construction. Also see paragraphs DEMOLITION AND REMOVALS and UTILITY LAYOUT AND DESIGN and Section 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD, for additional permitting information.

18. STORM DRAINAGE

18.1 Site Storm Drainage System

The site storm drainage system, if required shall be designed for a 10-year return storm frequency. No ponding shall occur for the 10-year event. Storm

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drainage system design shall be checked for a 100-year return event to insure no flooding or adverse impacts occur downstream. Storm drainage design shall be in accordance with TM-5-820-4. The storm drain collection system may consist of grassed ditches, gravel ditches, retention/detention ponds, grassed swales, concrete inlet drop or curb inlets, concrete headwall and pipe systems. Minimum capacity of the storm water system shall be for pre-development storm water runoff equal to post-development storm water runoff. The proposed system shall tie to the existing grassed ditches or pipe systems. The minimum pipe size for an open pipe system shall be 18 inches and 15 inches for a closed system.

18.2 Storm Drainage Pipe

18.2.1 Culverts shall be reinforced concrete pipe, Type III or IV and a minimum of 24 inches in diameter. Pipe joints shall be water tight with gaskets.

18.2.2 Fully coated, fully paved corrugated metal pipe is allowed within the site boundaries of the temporary facilities, except in the vehicle maintenance complex site.

18.2.3 Reinforced concrete pipe, type III shall be used in the vehicle maintenance complex site.

19. WATER DISTRIBUTION

19.1 The Contractor is required to design and construct the new water distribution utility service to the new facilities, where applicable. Water service shall be designed and constructed in accordance with TM 5-813-5 (AM #0002) and the 30 TAC 290, whichever is the more stringent. Minimum earth cover for the new utility lines will not be less than 27 inches, except for fire water supply lines where the minimum cover shall be 30 inches.

19.2 The Government anticipates that the Contractor will connect the new water laterals to the existing water distribution system and that sufficient pressure and quantity will be available for domestic and fire protection use. The design of the water distribution mains and service lines shall provide adequate quantity at sufficient pressure for domestic use and fire protection use. The Contractor shall determine minimum pressures in accordance with applicable plumbing and fire protection criteria.

19.3 The mains shall be designed and installed in accordance with NFPA 24 and applicable AWWA standards. Use C-900 pipe for water lines to avoid requirement for cathodic protection. Water mains shall follow existing streets or utility corridors. The design shall limit installation beneath pavements, where feasible.

19.4 Design of the service lines shall be in accordance with the National Plumbing Code and applicable AWWA standards. A curb stop or valve shall be installed near the point of connection to the main. Water service lines shall be equipped with suitable meters. Metering of fire service lines is not required. Provide isolation valves at underground tees or crosses. Valve boxes shall be at least 6 inches or larger.

19.5 Water Supply for Fire Protection

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New buildings will be sprinklered, where applicable, in accordance with the applicable codes, standards and regulations. Refer to paragraph **FIRE PROTECTION** for additional fire protection requirements.

19.5.1 Interior and outside fire protection shall be designed in accordance with UFC 3-600-01, Fire Protection Engineering for Facilities.

19.5.2 The Contractor shall provide the required water flow and pressure for the interior and outside (hose stream) demand.

19.5.3 The fire sprinkler supply line shall include a post indicator valve (PIV) with a tamper switch wired to the building fire alarm panel and a double check valve assembly backflow prevention device equipped with a flow detection meter. The backflow prevention device is located in the building. If the PIV is located in a concrete paved area, show an electrical conduit routed under the pavement.

19.5.4 Fire hydrants shall be located in accordance with UFC 3-600-01 and shall have a 6" shutoff valve for each hydrant. Fire hydrants shall have a 6" bell connection, two 2 ½" hose connections and one 4 ½" pumper connection. All hydrants shall be installed with a 6" gate valve for isolation. Provide at least two bollards around each hydrant subject to damage from vehicular traffic. Bollards will be located on the traffic side of the hydrant and spaced 2'-3' apart.

20. SANITARY SEWER

The Contractor is required to design and construct the new sewer service lines to support the new facilities, where applicable. The Contractor shall construct the new utilities in accordance with the requirements of **AM #0002 30 TAC 317 and** TM 5-814-1. The wastewater design should attempt to service the areas by gravity only, where feasible. The use of lift stations should be kept to a minimum. If lift stations are required, provide a packaged unit assembled of coated metals that do not easily corrode **AM #0002, they shall be in compliance with all applicable provisions of 30 TAC 317.2.** Provide an audible and visible alarm in case of a malfunction. Ensure that the location of the lift station is accessible for servicing. Minimum sewer main shall be 8 inches in diameter with a minimum of 6 inches for building sewer connections. Use SDR-26 PVC pipe for sewer piping to avoid the cathodic protection requirement. All sewer lines beneath buildings shall be SDR-26 PVC in lieu of cast iron. A tracer wire is not required for sewer pipe systems. Provide two way cleanouts at the building connection. See paragraph PLUMBING DESIGN REQUIREMENTS for additional information.

21. GAS DISTRIBUTION

The Contractor is required to design and construct the new gas distribution and service lines to support the new facilities, where applicable. The Contractor shall construct these utilities in accordance with the requirements of TM 5-848-1. DPW will determine whether or not the distribution pressure gas service is sufficient to serve the proposed construction. DPW will also indicate the location for the service tap. Gas distribution lines will be metered and regulated in accordance with applicable codes and regulations. Provide anodeless risers to regulators. Lines to regulators shall not be less than 1 inch. Use PE piping in lieu of ferrous metal underground piping. Provide poly valves in lieu of metal for underground valves. Limit gas valves to 8 inches. Ensure valve boxes are at least 6 inches or larger. All buildings shall be metered. The meter shall have a valved bypass. Provide ¾"

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plugged taps on each side of the pressure regulator. See paragraph HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS for additional information.

22. SITE GRADING

22.1 **AM #0002** The finish floor elevations of the new facilities shall be a minimum of 1 foot above finished grade. Arms vault finished floor shall be a minimum of 6 inches above finished grades. Finished floors for the vehicle maintenance buildings shall be 8" above finished grade and 1" above vehicle bay door entrance pavement. ~~The finish floor elevations of the Unit Storage Facility and the Battalion Classroom (Option 1) shall be a minimum of 1 foot above finished grade.~~ Finished grades shall provide positive drainage of 5% away from the building for a minimum distance of 10 feet. Minimum finish grades do not apply to drainage swales and ditches. Swales and ditches shall have a desired minimum of 0.5% at the flow line, with an absolute minimum slope of 0.3%.

23. FOUNDATION AND GEOTECHNICAL DESIGN

Refer to the Government Geotechnical Report (Preliminary), included as Appendix A, for the minimum geotechnical requirements for design and construction of project foundation and pavement features.

24. LANDSCAPE DESIGN

AM #0002 Landscaping is not required. Turfing or seeding shall be required for disturbed sites where paving is not provided. See Section 01421 BASIC STORM WATER POLLUTION PREVENTION PLAN. ~~Turfing and landscaping is not required.~~

25. IRRIGATION SYSTEM

Irrigation system is not required.

26. ARCHITECTURAL DESIGN REQUIREMENTS

26.1 GENERAL

(AM #0002)

a. All facilities shall include stairs or ramps and entry landings at all entrances to meet applicable codes.

b. All facilities with crawl space shall have skirting. All janitor closets shall have mop sink, mop rack, 6 linear feet of storage shelving and floor space for storage of janitorial equipment.

c. See electrical requirements for communications room/SIPRNET communication room requirements.

26.2 Functional Layout

Functional requirements are described in the Facility Functional Requirements documents. Arrange spaces in an efficient manner with simple circulation.

26.3 Room Sizes

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Room sizes shown in Facility Functional Requirements documents, **(AM #0002) including Appendix K RELOCATABLE FACILITIES FUNCTIONAL REQUIREMENTS and the drawings,** are minimum clear space. Minor adjustments to room sizes may be acceptable if furnishing and functioning of the rooms are unaffected, **(AM #0002) except barracks bedroom and closet shall not be less than the minimum stated area.** Ceilings at occupied areas shall be minimum 8 feet-0 inches.

26.4 Handicapped Accessibility

Facilities shall be handicapped accessible **(AM #0002) when required in Appendix K RELOCATABLE FACILITIES FUNCTIONAL REQUIREMENTS** ~~unless otherwise exempted.~~

26.5 Finishes

Exterior and interior finishes shall be the manufacturer's standard commercial-grade products and standard colors except where noted otherwise or specified in the UFGS guide specifications. Facilities of the same type grouped on the same site shall have the same exterior finishes and colors. Preferred exterior wall color is beige. Floor finish in bathrooms, restrooms, janitor closets, shower/locker rooms, and all other wet areas shall be seamless resilient flooring **(AM #0002)** ~~or ceramic tile.~~ Suspended acoustic tile ceiling is not permitted for **(AM #0002) wet areas,** barracks bedrooms, and closets.

26.6 Doors And Windows

All exterior glazing shall be 1/4-inch laminated glass consisting of two 1/8-inch thick glass panes bonded together with a minimum 0.030-inch thick PVB interlayer. For insulating glass units, the inner pane shall be laminated glass as described above. Glazed door and window frames shall resist an equivalent static design load of 1 lb per square inch applied to surface of glazing and frame with frame deformation not exceeding 1/60 of the unsupported member lengths. Steel members may be designed using ultimate yield stresses and aluminum members may be designed based on a 0.2 percent offset yield strength. Glazing shall have a minimum frame bite of 1 inch. Door/window frame connections to building, hardware and associated connections and glazing stop connections shall resist equivalent static design load of 10.8 psi for glazing panels with vision area less than or equal to 10.8 square feet and 4.4 psi for glazing panels with vision area greater than 10.8 square feet and less than 32 square feet. Loads shall be applied to the surface of the glazing and the frame. Connections and hardware may be designed based on ultimate strength for steel and 0.2 percent offset yield strength for aluminum. All exterior doors must swing out. Exterior doors shall be insulated hollow metal. Exterior entry doors shall be SDI Level 3. Except at vaults, interior doors shall be solid core. Windows shall be energy efficient with double pane insulating glass units. Each sleeping room shall have an operable window. Operable windows at administrative offices are preferred. All windows shall have mini-blinds. All operable windows shall have insect screens and locks.

26.7 Door Hardware

Doors shall have minimum three Grade 1 hinges per leaf. Locksets at exterior doors, living unit entry doors, and individual sleeping room doors shall be grade 1, with deadlock feature. All exterior outswinging doors shall have non-removable hinge pins. See paragraph CONSTRUCTION ELEMENTS AND PRODUCTS.

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26.8 Arms Vault

Arms vault shall be five-sided UL Class 3 modular vault. Door shall be GSA Class 5 vault door with (AM #0002) day gate ~~daygate~~ and built-in three-position, dial-type changeable combination lock. Slab on grade at arms vault shall be 6 inches thick reinforced with W4 by W4 mesh 6 inches by 6 inches or equivalent bars. See mechanical and electrical for additional requirements.

26.9 Document Vault

Document vault shall be six-sided UL Class M modular vault. Door shall be GSA Class 5 vault door with (AM #0002) day gate ~~daygate~~ and built-in three-position, dial-type changeable combination lock. See mechanical and electrical for additional requirements.

26.10 TA-50 Locker

TA-50 locker shall be heavy-duty ventilated locker with 14 ga steel doors and 16 ga steel sides, tops, bottoms and shelves. Frame shall be welded. Doors and sides shall be perforated in a diamond-shaped pattern for ventilation. Doors shall have padlock hasp. Finish shall be manufacturer's standard baked enamel in manufacturer's standard color. Size of each locker shall be 24 inches by 24 inches by 72 inches high.

26.11 Sound Isolation

Partitions at barracks bedrooms, private offices, conference rooms, and classrooms shall have STC 49 for sound isolation from all adjacent rooms. At barracks, perimeter of sound isolation area at each bedroom (AM #0002) shall ~~may~~ include the occupant's closet.

26.12 Building Numbers

Each new facility shall have a building number sign located on two faces, permanently affixed to building. Location, design, size and colors shall be in accordance with Fort Hood Installation Design Guide. Coordinate with Fort Hood for assigned building numbers for each facility.

26.13 Fire Extinguishers

Provide fire extinguishers as required by Installation requirements or code. Fort Hood's DPW Fire Dept. no longer provides fire extinguishers.

26.14 Rainwater Management

Each new facility shall have gutters, downspouts, and concrete splash blocks. If gutters are not feasible for the type of structure provided, provide some means of diverting rainwater from the roof around all personnel doors is required; provide justification.

27. STRUCTURAL INTERIOR DESIGN (SID)

See Section 01016 DESIGN DOCUMENTS REQUIREMENTS for additional requirements.

27.1 Definition

The Structural Interior Design (SID) shall involve the selection and sampling of all applied building related finishes necessary to complete the building's

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interior and exterior architecture. The SID submittal shall be submitted concurrent with the architectural design submittals.

27.2 Exterior and Interior Finish Design Review

The Contractor shall attend and present all exterior and interior finishes at the design reviews. The purpose of the design reviews is to present and discuss the SID color scheme for the project. Actual exterior and interior materials, finishes, and colors are to be provided for review and comment. At the end of the design review the Government will decide the final SID finishes that will be accepted for incorporation into the facilities.

27.3 In general, the SID shall reflect a transitional, professional image. Wall colors throughout the facility shall be a neutral color that will enhance accent colors in the existing furniture related items. Accent walls will not be approved for private offices. Accent walls will not be approved except for the lobby areas. The cove base and door trim shall be a neutral color and shall be consistent throughout the facility. Interior stain colors and finishes shall be consistent throughout the facility. All finishes shall be Class A. Specific locations where the various materials are required will be indicated during the design after award submittals.

27.4 Signage Requirements

Interior signage is an important item that is to be fully integrated with the architecture and building related finishes. All signage shall be in accordance with the Department of the Army Technical manual, Signage, TM 5-807-10 and installation sign standards (see Fort Hood Installation Design Guide). All signs are to be from one manufacturer and shall match in color and style. All room sign copy shall be Helvetica medium with a ratio of height and width to meet Americans with Disabilities Act (ADA) requirements. Signs shall be provided for all interior doors. Installation shall be wall mounted, on the latch side of the door with the center of the sign installed 5 feet-0 inch above the finish floor and 3 inches from the outside edge of the metal door frame. Where conditions do not allow signs to be mounted directly adjacent to the door, install signs on the wall at the nearest point to the latch side. Signage for general office areas (BB2) shall be a modular plaque format with a minimum of two insert slides. All signs are to have a permanent room number sign. All signs shall be a minimum overall dimension of 9 inches wide and 6 inches high. Under the visual printed room number an integral, tactile, corresponding, Grade 2 Braille indicating the room number. The second two slides are to be window insert slides to accommodate personnel changes or room name changes. Living Unit signs (BB5) shall be modular plaque format with a min. of three insert slides. Insert shall allow the user to insert computer generated copy behind acrylic face insert. BB5 sign types shall be 6 inches wide by 8 inches high. Mechanical rooms and other building system room and service support rooms (BB4) including restrooms (BB7) shall have permanent room signs with copy that has raised room numbers and permanent room names. Copy shall be raised, tactile, letters and Grade 2 Braille indicating the room number and room name. Signs shall be permanently and mechanically attached to the building. Double-sided tape is not acceptable. Signage message shall be coordinated with the Government/user before ordering or installation. Provide Emergency Egress sign plaques (BB8) that indicate "YOU ARE HERE" and the path of egress. These signs shall be fully coordinated with the Installation Fire Marshal at the review submittal design phase and before fabrication and installation. The Fire Marshal shall review the correct placement and quantity of the signs within the building and also review the proposed path of egress that will be graphically illustrated on the

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sign. Suggested placements for the signs shall be determined prior to installation.

28. COMPREHENSIVE INTERIOR DESIGN (CID)

28.1 (AM #0002) ~~The preparation of the Comprehensive Interior Design is part of the Base Bid.~~ The Contractor shall install furniture and other items listed in the Contractor-prepared CID. The furniture shall be coordinated with the prepared and approved Furniture Placement drawings developed in the SID. Installation shall include scheduling shipments from vendors, accepting delivery at the site, unloading, inventorying, securing and installing the items. See Section 01016 DESIGN DOCUMENTS REQUIREMENTS for additional requirements.

28.2 Definition

The CID involves all the furniture-related components necessary to complete the interior environment. The necessary components includes all loose furniture and furnishings.

28.3 CID Philosophy

The CID for each facility shall be coordinated in color, texture, pattern, size, form and function with building footprint and the SID. Furnishings submitted for approval shall reflect the image and style presented in the architecture to further support the corporate image, and with the function and mission of the facility occupants considered. All furniture/furnishings shall be selected under the guidance of the National Defense Authorization Act - FY 2002, S1438, Title VIII, Subtitle B, Sec 811, Para 2410 which states UNICOR is no longer a mandatory source for furniture and a waiver is not required from UNICOR on items before selecting from GSA Schedules. However, UNICOR shall be considered as a vendor to determine if UNICOR offers the "Best available" product in terms of quality, price, and timeliness. If a UNICOR product is not the "best value," then GSA schedules shall be used for selection of furniture/furnishings. All furniture/furnishings shall be selected form GSA Schedules or UNICOR. The GSA web site is: www.gsa.gov. The UNICOR web site is: www.unicor.gov.

28.4 Format

The CID presentation shall be 2-foot by 3-foot matte boards which show pictures of the furniture and shall include actual samples of the finishes, not photographs of the finishes. Presentation boards shall be grouped by areas, i.e. but not to exclude other areas, systems furniture, closed offices, executive offices, barracks rooms.

28.5 CID Coordination and Installation

The Contractor shall develop and fully coordinate the CID package with the SID package. The CID submittals shall run concurrent with the SID submittals. The Contractor is required to purchase the CID package items and is required to schedule with all the CID vendors the delivery and installation of the CID. Phasing the delivery and installation of the CID package items shall be determined by the Contractor. The Contractor will procure the CID items.

28.6 Requirement Analysis

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The Contractor shall determine the CID requirements. CID items and quantities shall be determined by but are not limited to: (1) the number of personnel to occupy the building, (2) job functions and related furniture/office equipment to support the job function (3) room functions (4) rank and grade. See Facility Functional Requirements documents for personnel and equipment requirements.

28.7 CID Furnishing List

Typical CID items to specify are, but not limited to:

(AM #0002) ~~Executive Wood Furniture~~

Support desks

Bookcases

Bulletin Board, Porcelain Marker Boards

(AM #0002) **Seating, including chairs and stools** ~~Chairs-all kinds, including stools~~

Desks-freestanding technical support and Executive Level Quality

Panel supported, systems furniture workstations- prewired (see Elect.)

(AM #0002) **File cabinets** ~~Files-all kinds~~

Lamps-all kinds

(AM #0002) ~~Podium/lecture stands~~

(AM #0002) **Storage cabinets** ~~Storage-all kinds~~

(AM #0002) **Tables** ~~Tables-all kinds~~

(AM #0002) **Waste containers - various sizes** ~~Waste cans-various sizes~~

(AM #0002) ~~Classroom chairs and tables~~

(AM #0002) ~~Conference room furniture~~

(AM #0002) **Appliances**

(AM #0002) **Include for submittal and review all specific/special items as required by the Government/user.** ~~Including all specific/special items as required by the Government/user~~

29. STRUCTURAL DESIGN REQUIREMENTS

29.1 General

The following criteria shall be used for loading, design and installation of all structural systems, including manufacturing, erection, supervision, testing and quality assurance. The completed structural design shall include all elements for foundations, walls, roof framing and diaphragms. It shall also include lateral load stability analyses as well as support for architectural features, mechanical and electrical equipment. Floor loads considered in the design shall include those necessary for the support of safes, vaults, special storage requirements, etc. as required by the user for specific functions in specific buildings. All calculations shall be performed by a registered engineer and checked by an engineer other than the design engineer. The primary code used for structural design shall be the 2000 International Building Code (IBC) and those codes referenced therein.

29.2 Design Loads

Dead loads shall be the actual weights of materials, including all mechanical and electrical items. Live loads and load combinations shall be in accordance with the requirements of the IBC 2000.

29.2.1 Wind load shall be in accordance with the IBC 2000.

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Wind Velocity: 90 mph
Exposure: C
Category: I
Importance Factor: 1.0

29.2.2 Seismic load shall be in accordance with IBC 2000.

Spectral Response

Ss: AM 0002 0.09
S1: AM 0002 0.05

29.3 Drawings

29.3.1 Walls mostly below grade that are supported laterally by diaphragms at or near the top and bottom, shall be designed using loadings based on at rest soil pressures.

29.3.2 Diaphragms shall have continuous chord members on all edges and shall have a direct positive connection for transferring load to all members of the main lateral force resisting system.

29.3.3 References and Design Criteria

- a. Minimum Design Loads for Buildings and Other Structures - ANSI/ASCE 7-2002.
- b. Fort Hood Installation Design Guide
- c. CESWD Architectural and Engineering Design Guide (CESWF-AEIM), including all references
- d. (UFGS) Unified Facilities Guide Specifications. The DESIGNER will be required to provide a fully edited Guide Specification for all applicable structural components. **AM 0002 Specification 13120, Standard Metal Building Systems, included as part of the TVM is not to be used. All specifications are to be the most current available.** All requirements contained in the RFP document must be incorporated into the edited specifications and/or drawings. Generally, the following structural specifications are required for building construction (other Guide Specs may be required depending upon the structural system used):

02466A DRILLED FOUNDATION CAISSONS (PIERS)
03100a STRUCTURAL CONCRETE FORMWORK
03150a EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS
03200a CONCRETE REINFORCEMENT
03300 CAST-IN-PLACE STRUCTURAL CONCRETE (FOR BUILDING CONSTRUCTION)
03370 CONCRETE FLOOR HARDENER
04200 MASONRY
04210 NONBEARING MASONRY VENEER/STEEL STUD WALLS AM 0002
05120 STRUCTURAL STEEL
05210 STEEL JOISTS
05310 STEEL DECKING AM 0002
05400 COLD FORMED METAL FRAMING

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13120 PREENGINEERED METAL BUILDINGS

- e. AM 0002 MBMA-01 Low Rise Building Systems Manual (latest edition).
- f. AM 0002 National Concrete Masonry Association (NCMA), Specifications for the Design and Construction of Load Bearing Concrete Masonry.
- ~~AM 0002 g. Design and Construction of Load Bearing Concrete Masonry.~~
- g. ACI-ASCE 530, Building Code Requirements for Concrete Masonry (2002)
- h. American Institute Of Steel Construction (AISC), Manual of Steel Construction, 9th edition
- i. Manual of Steel Construction, LRFD 3rd edition
- j. Steel Deck Institute (SDI) Diaphragm Design Manual (latest edition)
- k. American Welding Society, Welding Handbook
- l. Steel Joist Institute (SJI) Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders
- m. ACI 315-02, Details and Detailing of Concrete Reinforcement
- n. ACI 318-02, Building Code Requirements for Structural Concrete
- o. SDI Design Manual for Composite Decks, Form Decks, Roof Decks, and Cellular Decks
- p. (AM #0002) American Plywood Association, "APA Design/Construction Guide"
- q. (AM #0002) "SDI Diaphragm Design Manual latest Edition."
- r. (AM #0002) National Forest Products Association, "National Design Specification for Stress Grade Lumber and its Fastening."
- s. (AM #0002) American Plywood Association, "APA Design/Construction Guide."
- t. (AM #0002) Truss Plate Institute, "Design Specification for Metal Plate Connected Wood Trusses."
- u. (AM #0002) American Institute of Timber Construction (AITC)
- v. (AM #0002) TI 809-07, Design of Cold-Formed Load Bearing Steel Systems and Masonry Veneer/Steel Stud Walls (Nov. 98).

Design Guidance

Design Criteria - International Building Code 2000. To prevent cracking of brick veneer, limit building drift for a brick veneer building to

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h/400. Limit building drift for a metal skinned building to h/180 to prevent damage to interior partitions. Design for a 50-year recurrence interval with the design parameters stated above, where "h" is the eave height. **(AM 0002) For the relocatable structures provide a minimum factor of safety of 1.5 against sliding or overturning considering wind and dead load only.**

29.4 Foundations **(AM 0002) (Optional for Relocatable Buildings Except Vehicle Maintenance)**

Foundations for permanent structures shall be reinforced concrete continuous spread footings, isolated spread footings, carton formed slabs, grade beams, drilled piers, ribbed mat slab, **(AM 0002) prestressed ribbed mat slab**, or other as required by geotechnical investigation. **(AM 0002) See AEIM page VI-15, paragraph 8.6, Prestressed Designs for additional prestressed design requirements.** Ground floor slab systems shall be slab-on-grade or supported by piers as recommended by geotechnical investigation. Voids under grade beams, where required for expansive soils conditions, shall be formed with wood and not with fiber voids. Refer to Geotechnical insert for additional requirements. **(AM 0002) See Architectural Engineering Instruction Manual (AEIM) Plate C-22 for typical pipe bollard (guard) detail.**

29.5 Concrete Design **(AM 0002) (Optional for Relocatable Buildings Except Vehicle Maintenance)**

29.5.1 Concrete Materials:

- a. Cement: ASTM C 150, Type I-II Portland cement
- b. Fly Ash: ASTM C 618, Class "F" ; fly ash shall not exceed 20% of cement content or 100 Lbs of fly ash per cubic yard of concrete, whichever is less.
- c. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 120
- d. Fine Aggregate: ASTM C 33
- e. Coarse Aggregate: ASTM C 33
- f. Air-Entraining Admixture: ASTM C 260
- g. Accelerating, retarding and water-reducing admixtures: ASTM C 494
- h. Flowing Concrete Admixture: ASTM C 1017, Type 1 or 2
- i. Calcium Chloride shall not be permitted

29.6 Slabs **AM 0002 (Optional for Relocatable Buildings Except Vehicle Maintenance)**

29.6.1 Slabs-on-grade shall be a minimum thickness of 4 inches and reinforced with deformed reinforcing steel bars or welded wire fabric. All floor slab thicknesses shall be designed for the loads associated with the function of the specific area considered. The storage building **(AM 0002) and relocatable vehicle maintenance shall have a minimum 6" concrete slab reinforced with #4 at 12" on center each way. The covered concrete loading dock at site 4900B shall have a minimum 5" concrete slab reinforced with #4 at 12" on center each way.**

29.6.2 Vapor Barrier/Capillary Water Barrier

Provide vapor barrier under all interior floor slabs. Polyethylene sheet shall not be less than 6 mils thick. Provide a 6" capillary water barrier under the vapor barrier.

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29.6.3 Vertical and horizontal runs of conduits and pipes in slabs shall conform to ACI 318. Elevated slabs shall additionally meet the ratings of UL floor assemblies where required. Aluminum conduit and pipes will not be embedded in any concrete.

29.7 Masonry Design

29.7.1 Concrete masonry units shall have a minimum compressive strength of 2000 psi on gross area at 28 days.

29.7.2 Concrete Masonry Materials

- a. Hollow Concrete Masonry Units: ASTM C 90, Grade N, Type I or II
- b. Mortar for Masonry: ASTM C 270, Type S
- c. Grout for Masonry: ASTM C 476
- d. Horizontal Joint Reinforcement: minimum 9-gage deformed wire, ladder-type

29.7.3 Joints shall be 3/8 inch, tooled concave.

29.8 Structural Steel Design

29.8.1 If braced frames are used for all or part of the main lateral force resisting system, the stability of structural system shall not depend on any single member or connection. Redundancy shall be provided either by using multiple bays of tension only x-bracing or by using bracing members that are capable of both tension and compression if bracing is placed in a single bay.

29.9 Steel Decking Design

29.9.1 Form deck shall be galvanized. Metal form material shall be galvanized and a minimum 22 gage.

29.9.2 Steel roof deck material shall be shop painted and be 22 gage minimum. A structural steel roof deck shall be provided under all nonstructural metal roofs.

29.10 Cold Formed Steel Design

29.10.1 Cold Formed Steel Materials:

- a. Galvanized Structural Framing Members 16 gage and heavier: ASTM A 653, Grade D, 50 ksi.
- b. Galvanized Structural Framing Members 18 gage and lighter: ASTM A 653, Grade B, 36 ksi.

29.10.2 Trusses fabricated from cold-formed steel members shall be designed and the drawings stamped by a registered engineer. Minimum gage for members shall be 20 gage.

29.10.3 Cold-formed steel members, their components, and connection material shall have G90 galvanized coating.

29.11 Wood

29.11.1 Retardant Treatment, when required. Recommendations regarding the use of fire retardant treatment are provided in USDA Wood Handbook and

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National Protection Handbook. Pressure impregnation is the preferred treatment method.

29.11.2 Termite control measures will be used in areas prone to termite infestation. Soil will be treated with commonly accepted termite control products prior to construction.

29.12 Other Materials

29.12.1 There are no restrictions on proposing other materials to be used in the structural systems of this project if their strengths and durability can be substantiated by ASTM or other approved laboratory tests, and they satisfy the requirements of the design codes and criteria specified in this document.

29.12.2 All design, manufacture, fabrication, and assembly of other construction materials to be used in structural framing systems shall conform to the applicable design standards and meet specific industry standards as required for each subject material.

29.13 (AM #0002) Preengineered Metal Building Systems

Hairpins and adjacent hardstands shall not be used to resist the horizontal loads acting at the base of metal building system columns. Other methods such as foundation tie beams, anchorage to drilled piers, asphalt coated tie rods, or at-rest soil pressures acting on the foundation elements shall be used. Passive soil pressures will not be used to resist column thrusts unless sufficient supporting justification (including consideration of soil disturbance, moisture conditions, and deflection) is provided. Not more than one-half the full passive soil pressure will be used to resist horizontal thrust from columns.

30. (AM #0002) GENERAL PLUMBING DESIGN REQUIREMENTS

30.1 Plumbing system shall be designed and installed in accordance with the latest edition of the International Plumbing Code and the Fort Hood Installation Guide and Technical Supplement. The Contractor shall be responsible for finish installation of fixtures and piping systems. Each assembled facility shall have a one valve potable water connection and one sewer connection. The water line from the ground to the building shall be provided freeze protection. Gas lines and fixtures shall be installed in accordance with the latest edition of the NFPA 54 National Fuel Gas Code. Use the Unified Facilities Guide Specification.

30.2 Domestic Hot Water

Furnish and install water heaters with sufficient capacity and temperature regulation to handle peak requirements. Hot water delivered to plumbing fixtures in all facilities shall not exceed 120 degrees F.

30.3 Plumbing Fixtures

Plumbing fixtures shall be provided as indicated on architectural drawings. Fixtures shall be low-flow water conserving types, in accordance with the International Plumbing Code and current federal, state and DOD requirements. All handicap fixtures shall be ADA compliant.

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30.4 Drainage

30.4.1 Floor Drains

Floor drains shall be provided in all rooms with gang toilets, mechanical rooms, janitor rooms and for equipment requiring drainage. All floor drain traps shall be automatically primed by single trap primers or where appropriate distribution unit type trap primers.

30.5 Wall Hydrants (Exterior)

Wall hydrants shall be provided at a maximum spacing interval of 200 feet around the exterior wall of the building, with a minimum of two hydrants for each building, one on each opposing wall. Each hydrant shall be box type, freeze proof, with an integral vacuum breaker/backflow preventer. Hydrants shall have 3/4 inch hose connections.

31. FIRE PROTECTION

31.1 Design Standards and Codes

The fire protection design for all facilities shall be in accordance with the following:

INTERNATIONAL CODE COUNCIL, INC
5203 Leesburg Pike, Suite 708
Falls Church, VA 22041-3401

IBC, 2003, International Building Code

NATIONAL FIRE PROTECTION ASSOCIATION
One Batterymarch Park
Quincy, MA 02269-9101

National Fire Codes (NFC) Current as of 2004

UNIFIED FACILITIES CRITERIA

UFC 3-600-01, 2003, Design: Fire Protection Engineering for Facilities
UFGS Guide Specifications

31.1.1.1 Qualifications of Fire Protection Engineer. The design of the fire protection features shall be by a qualified fire protection engineer meeting one of the following conditions: a.) An engineer with a Bachelor of Science or Masters of Science Degree in fire protection engineering from an accredited university engineering program, plus a minimum of 5 years' work experience in fire protection engineering. b.) A registered professional engineer who has passed the National Council of Examiners for Engineering and Surveys (NCEE) fire protection engineering written examination. c.) A registered P.E. in a related engineering discipline with a minimum of 5 years' experience dedicated to fire protection engineering. The name and credentials (education, registration, experience) of the fire protection engineer shall be submitted.

31.1.2 Fire Protection and Life Safety Analysis. A fire protection and life safety design analysis shall be provided for all buildings in the project. The analysis shall include classification of occupancy (both per the IBC and

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NFPA 101); type of construction; height and area limitations (include calculations for allowable area increases); life safety provisions (exit travel distances, common path distances, dead end distances, exit unit width required and provided); building separation or exposure protection; specific compliance with NFPA codes and the IBC; requirements for fire-rated walls, doors, fire dampers, etc.; analysis of automatic suppression systems and protected areas; water supplies; smoke control systems; fire alarm system, including connection to the base-wide system; fire detection system; standpipe systems; fire extinguishers; interior finish ratings; and other pertinent fire protection data. The analysis shall include a life safety floor plan for all buildings in the project showing occupant loading, occupancy classifications and construction type, egress travel distances, exit capacities, sprinklered areas, fire extinguisher locations, ratings of fire-resistive assemblies, and other data necessary to exhibit compliance with life safety code requirements.

31.2 Fire Flow Data. Refer to Civil Design for design requirements.

31.3 Sprinkler System

31.3.1 Automatic sprinkler protection shall be provided for buildings as follows:

Classroom Facility. Provide sprinkler protection per the requirements of UFC 3-600-01 and NFPA 101 for Assembly type occupancies.

31.3.2 Design Requirements

Where sprinkler protection is required the facilities shall be fully protected with automatic wet pipe sprinkler systems. Dry pipe systems shall be provided if freeze protection is required. All floors and all areas of the facilities shall be protected. The sprinkler system design shall be in accordance with UFC 3-600-01, NFPA 13, and NFPA 13R where applicable. The sprinkler hazard classifications shall be in accordance with UFC 3-600-01 appendix B and NFPA 13. Design densities, design areas and exterior hose streams shall be in accordance with UFC 3-600-01 table 4-1. The sprinkler systems shall be designed and all piping sized with computer generated hydraulic calculations. The exterior hose stream demand shall be included in the hydraulic calculations. A complete sprinkler system design, including sprinklers, branch lines, floor mains and risers, shall be shown on the drawings. The sprinkler system plans shall include node and pipe identification used in the hydraulic calculations. All sprinkler system drains, including main drains, test drains, and auxiliary drains, shall be routed to a 2' x 2' splash block at exterior grade.

31.3.3 Sprinkler System

The sprinkler service main shall be a dedicated line. Sprinkler service and domestic service shall not be combined. The sprinkler service main shall be provided with an exterior post indicator valve with tamper switch reporting to the fire alarm control panel (FACP). The service main shall extend from the water distribution system to the building and shall be dedicated for fire protection. The sprinkler entry riser shall include a double check backflow preventer, a fire department connection, and a wall hydrant for testing of backflow preventer. The sprinkler system shall include an indicating control valve, an alarm check valve or dry pipe valve, a water motor alarm and a flow switch reporting to the FACP. All control valves shall be OS&Y gate type and shall be provided with tamper switches connected to the FACP. Facilities with multiple floors shall be provided with floor control valves for each floor.

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The floor control valve assembly shall be in accordance with NFPA 13, Figure A-5-15.4.2 (b). Clearances for piping passing through floor slabs shall be provided by pipe sleeves with dimensions per NFPA 13, 9.3.4.3. Clearance for all other penetrations shall be per NFPA 13, 9.3.4.

31.3.4 Sprinklers

Sprinklers located in finished areas shall be recessed pendant type.

31.3.5 Exterior Hose Stream

Exterior hose stream demand shall be in accordance with UFC 3-600-01. This shall be 250 gpm for light hazard and 500 gpm for ordinary hazard. Exterior hose stream demand shall be included in the sprinkler system hydraulic calculations.

31.3.6 Backflow Preventer

A double check backflow preventer shall be provided on the fire water main serving each building. This shall be located within the building. An exterior wall hydrant with OS&Y valve shall be provided to allow testing of backflow preventer at design flow as required by NFPA 13.

31.3.7 Fire Department Connection

A fire department connection shall be provided for each building with sprinkler protection. These shall be located to be directly accessible to the fire department.

31.4 Fire Pump

If required a complete fire pump installation shall be provided. Fire pump installation shall be in accordance with UFC 3-600-01, NFPA 13, NFPA 20, and UFGS 13920.

31.5 System Components and Hardware

Materials for the sprinkler system and fire pump system (if required) shall be in accordance with NFPA 13, NFPA 20, and NFPA 24. Sprinkler and standpipe system piping shall be black steel and shall be minimum Schedule 40 for sizes 2 inches and less and minimum Schedule 10 for sizes greater than 2 inches.

31.6 Fire Hydrants

Refer to Site Design for design requirements.

31.6.1 Fire Extinguishers and Cabinets

Refer to Architectural Design for design requirements.

31.7 Fire Alarm and Detection System

Refer to Electrical Design for design requirements.

**32. (AM #0002) GENERAL HEATING, VENTILATING, AND AIR CONDITIONING
REQUIREMENTS**

32.1 Mechanical Requirements

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The mechanical systems will be designed in accordance with the Request for Proposal issued by the Fort Worth Corps of Engineers, ASHRAE standards, International Mechanical code, NFPA Standards and the International Standard Plumbing Code. The Unified Facilities Guide Specifications will be used.

The mechanical system shall comply with the following design criteria and standards:

- ASHRAE Standard 90.1-2001, Energy Standard for Buildings, Except Low-Rise Residential Buildings
- International Mechanical Code.
- ASHRAE Manuals, latest edition.
- NFPA 90A, Installation of Air Conditioning and Ventilating Systems.
- NFPA 90B, Installation of Warm Air Heating and Air Conditioning Systems.
- ASHRAE Standard 62-2001, Ventilation for Acceptable Indoor Air Quality.
- SMACNA HVAC Duct Construction Standards, latest editions.
- Fort Hood Installation Design Guide And the Technical Supplement.

32.2 Heating, Ventilation, and Air Conditioning (HVAC)

All HVAC units shall be electric. Gas may be used for heating. Unitary equipment shall be applicable with their corresponding ARI and UL standards. Air-cooled split and packaged systems shall have a minimum EER per the following table:

<u>Cooling capacity range (Btu/hr)</u>	<u>Minimum EER</u>
less than 65,000	9.5
greater than or equal to 65,000, less than 135,000	10.3
greater than or equal to 135,000, less than 240,000	9.7
greater than or equal to 135,000	9.5

All air-cooled split and packaged systems shall have a minimum COP of 2.0. Chillers shall have a minimum EER of 9.5 and a minimum COP of 2.8. Thru-the-wall units shall have a minimum EER of 8.5. Where possible use air to air heat pumps with supplemental electric heating

32.3 Ventilation Systems Design

Ventilation for building occupants shall be provided in accordance with ASHRAE Standard 62-2001. The outside air intake shall be located away from fumes including vehicle exhaust, printing process exhaust, generator exhaust, toilet exhaust, etc. Exhaust systems shall exhaust all toilet rooms, bathrooms,

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janitor's closets, lockers, battery storage room, warehouse room, arms vaults, mailrooms, and other spaces as required.

32.4 Design Parameters

32.4.1 Outdoor Design Temperatures shall be 97 degrees F dry bulb/73 degrees F wet bulb summer design and 25 degrees F dry bulb winter design for Fort Hood.

32.4.2 For air conditioned areas the indoor summer design temperature/conditions shall be 78 degrees F/50 percent relative humidity, and indoor winter design temperature shall be 70 degrees F. Include capacity allowance for fresh air quantities in accordance with ASHRAE 62-2001 Ventilation Standards.

32.4.3 Electrical Rooms, Mechanical Rooms and Communications Equipment. Mechanical Rooms and Electrical rooms shall be heated and ventilated. Unit heaters shall be provided in these rooms to maintain a minimum temperature of 40 degrees F for freeze protection. Ventilation rates of 10 and 20 air changes per hour minimum shall be used. A two-speed, thermostatically-controlled fan shall be provided to accomplish the 10 ac/hr and 20 ac/hr rates. The space shall be maintained at a maximum of 10 degrees F above outside design ambient in summer. Ventilation shall be positively introduced within the mechanical room if equipment with atmospheric burners is used in the room. Electrical rooms shall be ventilated and shall maintain a winter design temperature of 55 degrees F. Communications and SIPRNET equipment shall be in an environment that is air-conditioned to maintain 72 degrees F year-round, 24 hours per day.

32.5 Metering: Electricity and Potable Water

Potable water, gas, and electricity shall be metered. Meters shall all have pulse outputs, data collection/communication capability and shall be compatible with Fort Hood Standards. Electric metering is specified in Electrical Design.

32.6 Acoustical Criteria

Systems shall be designed to meet the following noise criteria:

<u>Area</u>	<u>NC Level</u>
General open offices	40
Enclosed offices	30
Lobbies and common areas	40
Conference rooms	30
Sleeping areas	30

Acoustical treatments such as duct lining and sound attenuators shall be used to achieve these levels. Any spaces not specifically listed above shall be coordinated with the user.

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32.7 Personnel Loads

See Architectural portion of RFP for people loads in the facilities.

32.8 Internal Loads

Each office and/or work station receives one personal computer.

Break room equipment includes soda vending machine, full size refrigerator, and coffee maker.

See architectural for additional equipment.

32.9 HVAC Equipment

The equipment described below is a minimum. All materials and equipment provided shall be standard catalogued products of manufacturers regularly engaged in the production of such materials and equipment and shall be of the manufacturers' latest standard design. Equipment shall comply with the requirements of Underwriter's Laboratories, Inc. (UL), Air Conditioning Refrigeration Institute (ARI), American Society for Testing and Materials (ASTM), National Electric Manufacturer's Association (NEMA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA), or other national trade associations as applicable.

Ensure that any new boiler is less than 10MMBtuh and has a low NOx burner installed. This keeps the installation out of requirements under New Source Performance Standards and Title V operating permit revisions. Boilers must still comply with requirements of 30 Texas Administrative Code 106.183

Condensate drains from the evaporator coils will be piped to the sewer line through a trap after the drain pan then through an air gap to a floor drain or raised pipe followed by a trap.

Provide copies of invoices that indicate the amount of refrigerant added to HVAC equipment which contains 50-lbs or more to the DPW Environmental Division's Ozone Depleting Substance Program Manager, Robert Kennedy, 287-8714 in accordance with Fort Hood's Title V air operating permit # O-01659 and 40 CFR 82.

All pieces of floor mounted mechanical equipment shall be installed on a 4-inch thick housekeeping pad. Provide pad 6 inches larger than equipment footprint on all sides. Anchor the pad to the floor.

All suspended equipment shall be properly supported according to the manufacturer's instructions. Provide trapeze hangers for larger pieces of equipment. Provide adequate clearance around all pieces of equipment for periodic maintenance, inspection and cleaning. Service of one piece shall not require disturbance of adjacent equipment.

Each piece of motorized equipment shall be provided with vibration isolators per latest edition ASHRAE Fundamentals Handbook. Nominal deflection and natural frequency of isolation equipment shall be selected based upon equipment size and structural attachment details.

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All strainers and air separators are to be equipped with blow down valves and piped to a floor drain.

Roof mounted equipment is not acceptable. All equipment shall be accessible from the first floor.

Mechanical components shall be installed and mounted in accordance with seismic guidelines per latest edition of ASHRAE Applications Handbook.

32.9.1 Fans

Provide an exhaust fan in each toilet room which has a ventilation rate that meets ASHRAE Standard 62-2001; and in toilet rooms with a single toilet, position the exhaust fan directly above the toilet. Exhaust volume flow rate for toilet area shall be minimum of 2 cfm per square foot of floor area. Toilet fans shall operate with a switch. Exhaust air shall be discharged to the outside.

32.10 System Maintainability

Ensure that filters, controls, control valves, and coils are easily accessible for servicing and cleaning. Isolation valves shall be provided for each terminal unit, zone, branch, long runs, etc. as necessary for proper isolation and maintenance. Coils shall be fully removable without requiring demolition of any building components. Piping configuration at all coils shall include unions to facilitate easy coil removal.

32.11 Air Distribution

Ductwork shall be constructed of sheet metal to SMACNA HVAC Duct Construction Standards, 1995 edition. Ceiling return air plenums shall not be used. All ductwork designated to be constructed at a duct pressure class of 3-inch water gauge or greater shall be pressure tested. Any device (filter, fan, coil or other component) in the air supply, return or exhaust system that will normally operate at these pressures shall be included in the test. The maximum allowable leakage rate shall be in accordance with the SMACNA Leakage Test Manual for the Leakage Class (C) associated with the duct Seal Class. Test procedure, apparatus, and report shall conform to SMACNA. The leakage test shall be satisfactorily completed prior to applying the external duct insulation. Access must be provided to all devices or areas that may require periodic inspection, including but not limited to balancing devices, motor operated dampers, flow measuring stations, smoke/fire dampers, etc. Diffusers shall be located to ensure that the air distribution will completely cover all surfaces of exterior walls with a blanket of conditioned air or may be of a compact design so long as 'dead spots' within the units are avoided. At least one diffuser shall be provided in each habitable room. Diffusers shall be provided with integral opposed blade damper. Diffusers shall be provided with air deflectors as required for proper air flow in the space. Plastic diffusers are prohibited. Ceiling mounted units shall have factory finish to match ceiling color, and be installed with rims tight against ceiling. Sponge-rubber gaskets shall be provided between ceiling or wall and surface-mounted diffusers for air leakage control. Diffuser boots shall be sealed tight to the wall or ceiling they penetrate using duct mastic or caulking. Suitable trim shall be provided for flush-mounted diffusers. Duct collar

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connecting the duct to diffuser shall be airtight and shall not interfere with volume controller. Wall supply registers shall be installed at least 6 inches below the ceiling.

32.11.1 Duct Insulation

All supply, return, and outside air ductwork shall be insulated. Ductwork in areas exposed and subject to abuse shall use rigid insulation. Exposed heating only or exposed return air ductwork shall not be insulated. Exhaust ductwork does not require insulation. Internally lined ductwork shall not be allowed. Insulation shall be faced with a vapor barrier material having a performance rating not to exceed 1.0 perm. Insulation, vapor barrier, and closure systems shall be non-combustible as defined in NFPA 255, with a flame-spread rating of not more than 25, and a smoke development rating of not more than 50, as defined in ASTM E 84. Where insulated ducts pass through fire walls, fire partitions, above grade floors, and fire rated chase walls, the penetration shall be sealed with fire stopping materials.

32.12 Piping and Accessories

Refrigerant piping, valves, fittings, and accessories shall be in accordance with ASHRAE 15 and ASME B13.5. Refrigerant piping, valves, fittings, and accessories shall be compatible with the fluids used and capable of withstanding the pressures and temperatures of the service. Insulation shall be flexible elastomeric cellular insulation.

32.13 Controls

For HVAC systems or equipment that does not come with integral packaged controls, Direct Digital Controls (DDC) shall be used. The thermostats shall be digital with an off-on, and heat and cool switches. The heating and/or cooling setpoints will be fixed, non adjustable. Controls shall comply with the Lonworks Standard.

All buildings will be provided with Digital Control Units for their HVAC units. The Digital Control Units shall be as specified in Specification 13805 One-Way Frequency Modulation(FM) Utility Management and Control System (UMCS) Digital Control Unit.

33. (AM#2) INTERIOR ELECTRICAL DESIGN

33.1 Power Distribution System

In addition to the codes and standards listed in paragraph 28.1, the power distribution system shall be in accordance with UFC 3-520-01, Interior Electrical Systems (http://www.hnd.usace.army.mil/techinfo/ufc/ufc_3-520-01.pdf).

33.1.1 The power distribution system including the conductor and conduit, switchboards, panelboards, service entrance equipment and transformers shall be sized for no less than 25 percent spare capacity. Voltage drop shall not exceed 5 percent from the service transformer to any branch circuit electrical load. In addition, voltage drop shall not exceed 2 percent on feeders from

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the service transformer to the farthest distribution panel and shall not exceed 3 percent on branch circuits.

33.1.2 Switchboards and panelboards shall be located in electrical rooms only. Dry-type transformers shall be located in electrical rooms only.

33.1.3 Switchboards and panelboards shall be equipped with bolt-on circuit breakers sized for the load and available fault current. Series rated breakers shall not be used.

33.1.4 Electrical equipment shall be UL listed for the environment in which it is located.

33.1.5 All mechanical equipment shall have a properly sized disconnect switch, with respect to the National Electrical Code, provided within sight. Should a switch be installed in an exterior environment, then the switch shall be rated for that environment by NEMA.

33.1.6 Wiring shall consist of copper conductors with 600-volt insulation. The minimum conductor size shall be No. 12 AWG. Conductor sizes and ampacities are based on copper. Conductors No. 8 AWG and larger shall be stranded, and conductors No. 10 AWG and smaller diameter shall be solid. Conductors for branch circuits of 120 volts or more than 100 feet long and of 277 volts more than 230 feet long, from panel to load center shall be no smaller than No. 10 AWG.

33.1.7 The electrical distribution systems serving non-linear loads such as large administrative spaces shall be specifically designed for nonlinearity. Feeder neutrals shall be oversized and panelboards shall be equipped with 200% neutral busses. Dry-type transformers shall include a K-4 rating if non-linear loads make up more than 50% of the total load.

33.1.8 Transient Voltage Surge Suppression (TVSS) units may be included as an integral part of the panelboard or shall be hard-wired into the electrical distribution system in accordance with the manufacturer's recommendations utilizing a circuit breaker connection. Units shall be tested in accordance with IEEE C62.45 using an IEEE C62.41 Category B waveform and shall be UL 1449 listed and labeled. Modes of protection shall be normal mode (L-N, L-L) and common mode (L-G, N-G). The unit shall include self-diagnostic and self-testing capabilities, a re-settable transient event counter, and a local audible alarm with mute capability. Service panel surge current rating shall be 300kA minimum per phase and shall be 150kA minimum per phase at all other panels; and shall be rated and marked with a maximum UL suppressed voltage rating of 400V for 120/208 volt applications, and 800V for 277/480 volt applications.

33.1.9 Service grounding shall be in accordance with NEC Article 250. The maximum resistance of a driven ground shall not exceed 25 ohms under normally dry conditions. A separate grounding conductor sized in accordance with the NEC shall be provided in all circuits. The conduit system shall not serve as the equipment ground, and a green grounding conductor shall be provided and sized in accordance with NFPA 70. A copper ground bar shall be provided in each electrical room and communication room. Ground rods shall be of copper-

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clad steel not less than ¾ inch in diameter by 10 feet in length of sectional type driven full length into the earth.

33.1.10 Wiring shall conform to NFPA 70. Unless noted otherwise, wiring shall consist of insulated conductors installed in rigid aluminum conduit, rigid zinc-coated steel conduit, or rigid plastic conduit, or electrical metallic tubing, or electrical nonmetallic tubing, or intermediate metal conduit. Where cables and wires are installed in cable trays, they shall be of the type permitted by NFPA 70 for use in such applications. Wire fill in conduits shall be based on NFPA 70 for the type of conduit and wire insulation specified (based on copper conductors with insulation). Penetrations above grade floor slabs, time-rated partitions and fire walls shall be firestopped. Conduits and tubing, and the support system to which they are attached, shall be securely and rigidly fastened in place to prevent vertical and horizontal movement. Raceways shall not be supported using wire or nylon ties.

33.1.10.1 Metal conduits will be permitted when conduits are required for shielding or other special purposes indicated, or when required by conformance to NFPA 70.

33.1.10.2 Nonmetallic conduit and tubing may be used in damp, wet or corrosive locations when permitted by NFPA 70 and the conduit or tubing system is provided with appropriate boxes, covers, clamps, screws or other appropriate type of fittings.

33.1.10.3 Electrical metallic tubing (EMT) may be installed only within buildings. EMT may be installed in concrete or grout in dry locations, provided with concrete tight fittings. EMT shall not be installed in damp or wet locations, or the air space of exterior masonry cavity walls.

33.1.10.4 Aluminum conduit may be used only where installed exposed in dry locations.

33.1.10.5 Rigid steel conduit or IMC shall be installed in slabs-on-grade, and installed close to the middle of the concrete slabs as practical without disturbing the reinforcement.

33.1.11 Heat tracing shall be provided to protect utilities exposed to freezing temperatures.

33.1.12 All empty conduit shall be sealed, capped, and tagged; and shall include a pull wire.

33.1.13 Full-capacity standard NEMA taps shall be provided in the primary windings of transformers unless noted otherwise. Three-phase transformers shall be configured with delta-wye windings. Transformers, where primary is 600 Volt and less, shall be general purpose, dry-type, self-cooled, provided in a NEMA enclosure rated for the installation location, and be quiet type with maximum sound level at least 3 decibels less than NEMA standard level for transformer ratings.

33.1.14 Each motor shall conform to the hp and voltage ratings, and shall have a service factor and other characteristics that are essential to the proper application and performance of the motors under conditions shown or

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specified. Motors of 1.0 hp or more with open, drip-proof or totally enclosed fan cooled enclosures shall be high efficiency type, unless otherwise noted. Motors provided as an integral part of motor driven equipment are excluded from this requirement if a minimum seasonal or overall efficiency requirement is indicated for that equipment by provisions of another section.

33.2 Receptacle Outlet

33.2.1 Duplex receptacle: 20-ampere, 120 volt, non-locking NEMA type 5-20R, two-pole, three-wire, grounding type with polarized parallel slots.

33.2.1 Weatherproof duplex receptacles shall be provided outside each building entrance and at site mechanical equipment. Receptacles shall be suitable for damp locations and the housings shall be labeled to identify the allowable use. Additional weatherproof receptacles shall be provided such that the long side of each building will have at least one receptacle.

33.2.2 Ground Fault Circuit Interrupter (GFCI) receptacle outlets shall be provided in restrooms, wet locations, outdoors and other locations as required by the NEC or OSHA. GFCI receptacles shall be wired such that the loss of power on one receptacle shall not affect downstream receptacles. GFCI receptacles shall be provided adjacent to lavatories. In multi-lavatory toilets a minimum of one receptacle for every two lavatories shall be provided.

33.2.3 All equipment as identified herein or elsewhere in the RFP that require a receptacle shall be provided a receptacle of the appropriate rating and NEMA configuration to match the plug of said equipment. In addition, other receptacles shall be provided for or as otherwise required for a fully functional facility.

33.2.4 A minimum of one general-purpose 120 volt, 20-ampere duplex receptacle outlet shall be provided on each wall in each room unless otherwise indicated. In rooms where walls exceed 10 feet horizontally, an additional duplex outlet shall be provided for each additional 10 feet of wall or fraction thereof. Receptacle spacing shall not exceed 10 feet. General-purpose receptacles are in addition to special purpose and dedicated outlets for special equipment.

33.2.5 All corridors shall be provided with a minimum of one general-purpose 120 volt, 20-ampere duplex receptacle for floor cleaning equipment. The receptacle(s) shall be spaced in such a manner as to permit full coverage by the equipment with a 35-foot extension cord. Floor receptacles shall not be used.

33.2.6 Each LAN rack shall be provided a dedicated quadraplex receptacle mounted on the side of the rack 6 inches above finished floor (AFF). Each telephone backboard shall be provided two dedicated 120 volt, 20-ampere duplex receptacles in addition to the required general-purpose receptacles.

33.2.7 In each of the mechanical spaces and electrical spaces, a dedicated electrical circuit shall be provided for duplex receptacles to perform general tasks. The number of receptacles to be installed will be dependent on the size of the space, but if a wall space is greater than 10 feet, then a

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receptacle shall be placed on the wall. A minimum of one receptacle shall be placed in each of the spaces.

33.2.8 All equipment as identified herein or elsewhere in the RFP that require a receptacle shall be provided a receptacle of the appropriate rating and NEMA configuration to match the plug of said equipment. In addition, other receptacles shall be provided for or as otherwise required for a fully functional facility. Receptacles provided for copiers, facsimile machines, LAN racks, and common use network printers shall be served by dedicated branch circuits. The contractor shall engage the user for the installation of these dedicated receptacles and circuits.

33.2.9 A dedicated circuit shall be provided to each individual receptacle that provides electricity to an appliance. An appliance is, but not limited to: refrigerator, microwave, washing machine, clothes dryer, and so forth.

33.2.10 Receptacle outlets in finished areas shall be mounted 18 inches AFF unless otherwise indicated or required by code or criteria. Receptacles mounted above counter tops or at built-in desks shall be mounted to assure access from desktop equipment. Receptacles mounted at vanities shall be mounted above the backsplash.

33.2.11 Electrical outlet devices and faceplates shall be white, except faceplates in the vehicle maintenance shops, unit storage, and unfinished areas shall be stainless steel.

33.3 Interior Lighting

33.3.1 Design of the interior lighting system and selection of target illumination levels and uniformity ratios not indicated herein shall comply with the recommendations of the Illuminating Engineering Society of North America (IESNA) Lighting Handbook, 9th Edition. All interior spaces shall be illuminated with compact fluorescent luminaires or linear T8 fluorescent luminaries with the exceptions stated hereafter. Incandescent lighting shall not be allowed in any type of application other than 'reel lights' used for task lighting in the maintenance shops. Exterior usable spaces shall be illuminated with high-intensity discharge fixtures, unless noted otherwise.

33.3.2 Ambient illumination shall provide a generally glare-free, high quality lighting environment. All rooms including closets shall be illuminated. Recessed luminaires shall be provided in all areas with suspended ceilings. Recessed parabolic luminaires with 3-inch minimum blades shall be provided in all open admin areas and private offices. Lensed luminaires shall be equipped with 0.125 inch prismatic virgin acrylic. Surface mounted fixtures in occupied spaces shall be the low profile type (4-inch maximum depth).

33.3.3 Commercial grade luminaires with a residential appearance shall be provided in the barracks modules. Luminaires shall be provided in all barracks module rooms including walk-in closets. Low brightness wall-mounted luminaires with white lens shall be provided over vanity mirrors.

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33.3.4 Fluorescent lamps shall be low mercury content certified to pass the U.S. Environmental Protection Agency (EPA) Toxic Characteristics Leaching Procedures (TCLP) test for non-hazardous waste. Fluorescent lamps shall have a color corrected temperature (CCT) of 3000 degrees Kelvin except fluorescent lamps in vehicle service and maintenance areas shall have a color corrected temperature (CCT) of 4100 degrees Kelvin. Linear fluorescent lamps shall have a minimum color rendering index (CRI) of 75, and compact fluorescent lamps shall have a minimum color rendering index (CRI) of 80.

33.3.5 Fluorescent and compact fluorescent ballasts shall be electronic programmed rapid start capable of starting lamps at the anticipated ambient temperatures. Compact fluorescent ballasts shall include end-of-life protection. A three year full warranty including a \$10 labor allowance shall be provided.

33.3.6 Minimum efficiency standard for fluorescent tubes 4 feet and longer shall be 90 lumens/watt, for fluorescent tubes less than 4 feet shall be 80 lumens/watt, and for compact fluorescent lamps shall be 50 lumens/watt.

33.3.7 Lighting in all toilets (except in barracks), storage rooms, private offices, lounges and laundromats shall be controlled with occupancy sensors. Occupancy sensors may also be used in other areas for energy savings. Areas with lighting controlled by sensors shall have full (100 percent) coverage for walking motion.

33.3.8 Lighting in areas with multiple entrances shall be controlled with three-way and four-way switches or low voltage switches at each entrance. Alternatively, lighting in these areas may be controlled with occupancy sensors.

33.3.9 Facility entrances shall be illuminated with wall mounted luminaires or recessed lensed downlights mounted in the soffit where applicable.

33.3.10 Wall mounted exterior luminaires shall have full cutoff optics and shall be shrouded to obstruct lamp visibility. All wall mounted exterior luminaires shall be cast aluminum with a dark bronze polyester powder coat paint finish and shall be equipped with high pressure sodium lamps.

33.3.11 Photocell controlled wall mounted lighting shall be provided at the entrances to all secure unit storage buildings.

33.3.12 Emergency and exit lighting shall be provided in accordance with NFPA 101, Life Safety Code. Emergency lighting in rooms with fluorescent or compact fluorescent lighting shall consist of self-diagnostic emergency battery packs. Upon loss of power, the emergency lamp(s) within the fluorescent fixture shall light regardless of the light switch position. Emergency lighting in rooms with metal halide lighting shall consist of self-diagnostic wall mounted emergency lighting units. Exit lighting shall have red LED lettering and aluminum housing and face. Exit lights shall have integral battery backup and self-diagnostic capabilities.

33.3.13 Average maintained illumination levels shall be:

Arms Vaults	15 foot-candles
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Auditoriums	20 foot-candles
Barrack Sleeping Rooms	15 foot-candles
Cafeterias	25 foot-candles
Classrooms	50 foot-candles
Communication Distribution Nodes	50 foot-candles
Communication Rooms/Closets	50 foot-candles
Computer Rooms	50 foot-candles
Conference Rooms	30 foot-candles
Corridors	10 foot-candles
Electrical Rooms	15 foot-candles
Emergency Generator Rooms	15 foot-candles
General Office Space	50 foot-candles
Hangars	50 foot-candles
Janitor's Closets	5 foot-candles
Kitchens	70 foot-candles
Laundry	25 foot-candles
Lobbies	15 foot-candles
Lounges	15 foot-candles
Mechanical Rooms	15 foot-candles
Supply Rooms	20 foot-candles
Outdoor Shelters	5 foot-candles
Toilet Facilities	20 foot-candles
Vehicle Maintenance Shops	50 foot-candles
Warehouse - Active Bulk	10 foot-candles
Warehouse - Inactive	5 foot-candles
Warehouse - Rack	20 foot-candles

33.4 Interior Communication Systems

33.4.1 A completely operational communication system including, but not limited to, all necessary raceway, cabling, backboards, outlet boxes, terminations, jacks, and faceplates shall be provided. When a LAN is required, provide LAN racks, patch cords and patch panels. Duplex communication outlets shall consist of two RJ45 jacks in a 4-11/16" square box. Simplex communication outlets shall consist of one RJ45 jack in a 4-11/16" square box. Modular jacks shall be category 6 and shall meet the requirements of EIA ANSI/TIA/EIA-568-B and shall meet the Link Test parameters as listed in EIA TIA/EIA-TSB-67 and supplemented by EIA ANSI/TIA/EIA-568-B.2-1. Modular jack pin/pair configuration shall be T568B per EIA ANSI/TIA/EIA-568-B. Modular jacks shall be unkeyed. The homerun cabling from each duplex outlet back to the communications room/closet shall consist of two 4-pair, Category 6, #24 AWG solid unshielded twisted pair copper. The homerun cabling from each simplex jack outlet back to the communications room/closet shall consist of one 4-pair, Category 6, #24 AWG solid unshielded twisted pair copper. At every outlet, each 4-pair cable shall terminate on a Category 6, 8-pin modular jack. All 4-pair cables from RJ45 jacks shall terminate on Category 6 modular patch panels with RJ-45 connectors, where a LAN is required and if no LAN is required they shall punch down on type 66 terminal blocks that are wall mounted to a plywood backboard. Patch panels shall be mounted on 19" LAN racks. The cable length between instrument and backboard terminations shall not exceed 295 feet. Horizontal cable shall meet the requirements of EIA ANSI/TIA/EIA-568-B.2-1 for Category 6. Cable shall be label-verified. Cable jacket shall be factory marked at regular intervals indicating verifying organization and performance level. Cable shall be rated

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CMG or CMP, as appropriate, per NFPA 70. All cabling shall be installed in raceways.

33.4.2 Where a LAN is required, patch cords are required for a complete and functional system and shall be provided. Patch cords shall be cable assemblies consisting of flexible, twisted pair stranded wire with eight-position plugs at each end. Cable shall be label-verified. Cable jacket shall be factory marked at regular intervals indicating verifying organization and performance level. Patch cords shall be wired straight through; pin numbers shall be identical at each end and shall be paired to match T568B patch panel jack wiring per EIA ANSI/TIA/EIA-568-B. Patch cords shall be unkeyed. Patch cords shall be factory assembled. Patch cords shall conform to the requirements of EIA ANSI/TIA/EIA-568-B.2-1 for Category 6.

33.4.3 Connecting and cross-connecting hardware for copper cables shall be the same category as the cable it serves. Hardware shall be in accordance with EIA ANSI/TIA/EIA-568-B. Connectors for fiber optic strands shall be ST type with ceramic ferrule material with a maximum insertion loss of .5 dB. Connectors shall meet performance requirements of EIA ANSI/TIA/EIA-568-B. Connectors shall be field installable. Connectors shall utilize adhesive for fiber attachment to ferrule. Connectors shall terminate fiber sizes as required for the service.

33.4.4 Raceways for homerun cabling shall consist of cable tray and 1-inch minimum electrical metallic tubing (EMT) conduit. Raceways for all other facilities shall consist of 1-inch minimum electrical metallic tubing (EMT) conduit only. Raceways shall originate at the outlet and terminate inside the communications room/closet. Each conduit shall constitute a continuous run with NO pull boxes and NO more than two 90-degree bends in the entire run. Raceways consisting of cable trays and conduit shall be used to provide a centralized cable distribution system by providing a continuous cable tray from the communications room through the entire length of the building and centered as much as practical. Cable trays shall be located above ceilings (except in the communications room) and shall be mounted no higher than 6 inches above ceiling. Cable trays shall terminate behind LAN racks. Cable trays shall be sized to provide no less than one half square inch of cross-sectional area per jack served including CATV type "F" connectors. The cable tray fill ratio shall be 40 percent where practical. Conduit shall be provided between the outlet and the cable tray, and shall be physically strapped to the cable tray and attached with an anti-chaffing grommet.

33.4.5 A communication duplex outlet shall be provided alongside each computer receptacle, facsimile receptacle and common use printer receptacle. A communication simplex outlet shall be provided 52 inches AFF in each electrical room, mechanical room and communications room/closet.

33.4.6 Communication outlets in finished areas shall be mounted 18 inches AFF unless otherwise indicated or required by code or criteria. Communication outlets mounted above counter tops or at built-in desks shall be mounted to assure access from desktop equipment.

33.4.7 Communication outlets faceplates shall be white in finished areas and stainless steel in unfinished areas.

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33.4.8 Placement of communication outlets shall be coordinated with the furniture plans.

33.4.9 All empty conduit shall be sealed, capped and tagged and shall include a pull wire.

33.4.10 The communication backboard and LAN racks shall be mounted in an environmentally conditioned space dedicated exclusively to communications equipment.

33.4.11 Patch panels for copper cable shall consist of eight-position modular jacks, with rear mounted type 110 insulation displacement connectors, arranged in rows or columns on 19 inch rack mounted panels. Jack pin/pair configuration shall be T568B per EIA ANSI/TIA/EIA-568-B. Jacks shall be unkeyed. Panels shall be labeled with alphanumeric x-y coordinates. The modular jacks shall conform to the requirements of EIA ANSI/TIA/EIA-568-B, and shall be rated for use with Category 6 cable in accordance with EIA ANSI/TIA/EIA-568-B.2-1 and shall meet the Link Test parameters as listed in EIA TIA/EIA-TSB-67 and supplemented by EIA ANSI/TIA/EIA-568-B.2-1. A single unshielded twisted pair shall be punched down on each jack within the service patch panel as shown on attachment 1E. Terminations shall be blue/white and blue. The number of jacks required within patch panels will be equal to the number of outside pairs of cable entering the building plus 20% spare.

33.4.12 Patch panels for fiber optic strands shall be a complete system of components by a single manufacturer, and shall provide termination, splice storage, routing, radius limiting, cable fastening, storage, and cross-connection. Patch panels shall be modular with ST connectors. Patch panels shall be 19 inch rack mounted panels. Patch panels shall provide strain relief for cables. Panels shall be labeled with alphanumeric x-y coordinates. Patch panel connectors and couplers shall be the same type and configuration as used elsewhere in the system. Fiber optic strands serving each building shall be terminated on LAN rack mounted patch panels.

33.4.13 Terminal blocks shall be wall mounted (on plywood backboard) wire termination units consisting of insulation displacement connectors mounted in plastic blocks, frames or housings. Blocks shall be type 66 which meet the requirements of EIA ANSI/TIA/EIA-568-B, and shall be rated for use with Category 6 cable in accordance with EIA ANSI/TIA/EIA-568-B.2-1 and shall meet the Link Test parameters as listed in EIA TIA/EIA-TSB-67 and supplemented by EIA ANSI/TIA/EIA-568-B.2-1. Blocks shall be mounted on standoffs and shall include cable management hardware. Insulation displacement connectors shall terminate 22 or 24 gauge solid copper wire as a minimum, and shall be connected in pairs so that horizontal cable and connected jumper wires are on separate connected terminals. Terminal blocks are only required in those communication rooms/closets that do not have LAN racks. Size and number of terminal blocks shall be sufficient to accommodate all horizontal copper cabling within the facility.

33.4.14 LAN racks shall be floor mounted, welded steel relay racks with uprights to mount equipment 19 inches wide. Uprights shall be 3 inch deep channel, 1-1/4 inches wide, drilled and tapped 12-24 in a 1/2 inch pattern. Racks shall be provided with a standard top cross member, and predrilled base plate to allow floor fastening. Open frame LAN racks shall be 7 feet in

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height and painted. Back of racks shall be placed a minimum of 3 feet from wall to allow sufficient working clearances for termination of cables. AC outlets shall be provided in each rack. Racks shall be grounded to the building's primary grounding system utilizing a #6 AWG bare solid copper conductor in 3/4 inch conduit.

33.4.15 Cable guides shall be provided and shall be specifically manufactured for the purpose of routing cables, wires and patch cords horizontally and vertically on 19 inch LAN racks. Cable guides shall consist of ring or bracket-like devices mounted on rack panels for horizontal use or individually mounted for vertical use. Cable guides shall mount to racks by screws and/or nuts and lockwashers.

33.4.16 Plywood backboards shall be provided in each communications room/closet on a minimum of three walls. Backboards shall be 5/8" inch by 4 feet wide by the entire length of the wall. The backboard shall be mounted such that the bottom is 2.5 feet above finished floor and the 4 feet width is in the vertical direction. Backboards shall be securely fastened to the walls and shall be painted with white or light colored paint. A #6 AWG bare solid copper conductor in 3/4 inch conduit shall be provided between the backboard and the building's primary grounding system. Conductor shall be centered on backboard in the horizontal direction and 10 feet of slack shall be provided and coiled up on backboard. Although backboard is not continuous it shall be considered as one backboard for dedicated receptacle requirements.

33.4.17 Electrical boxes for communication outlets shall be 4-11/16 inch square by 2-1/8 inches deep with minimum 3/8 inch deep single or two gang plaster ring as required.

33.4.18 Outside plant (OSP) copper cabling shall terminate on protected 66 blocks as shown in attachment E1. The number and size of protector blocks shall be sufficient to terminate all incoming cabling. The protector modules shall be of the two-element gas tube type. Protection modules shall be heavy duty, A>10 kA, B>400, C>65A where A is the maximum single impulse discharge current, B is the impulse life and C is the AC discharge current per ANSI C62.61. The gas modules shall shunt high voltage to ground, fail short, be equipped with an external spark gap and heat coils, and shall comply with UL 497.

33.4.19 Cable trays shall be in accordance with NEMA VE 1 and shall be the trough-type except in the distribution node building trays shall be ladder type and sized as stated in the following paragraph. Cable trays shall be constructed of aluminum or copper-free aluminum or zinc-coated steel. Trays shall include splice and end plates, dropouts, and miscellaneous hardware. Edges, fittings, and hardware shall be finished free from burrs and sharp edges. Fittings shall have not less than the load-carrying ability of straight tray sections and shall have manufacturer's minimum standard radius. Radius of bends shall be 12 inches.

33.4.20 Each communication room/closet shall have 2-4" conduits (one with 4-1" inner ducts) stubbed up into the room/closet. Rooms/closets shall also have 2-1" conduits stubbed up inside room for cabling from electric and water meters to interface with the meter interface unit (MIU) that shall also be located in room/closet. An automated meter reading system specification is

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provided as part of this RFP describing the MIU. Conduits shall run to the 5 foot line outside the building. Outside location shall be coordinated with the exterior communications site plan and the civil site plan.

33.4.21 In addition to the requirements of paragraph 28.5 and all subparagraphs, the requirements stated in attachment 2E shall be followed. The attachment is the Ft. Hood Directorate of Information Management Building Communications wiring standard.

33.5 Cable Television (CATV)

33.5.1 A completely operational CATV system including, but not limited to, all necessary raceway, outlet boxes, cabling, terminations, splitters, jacks, and faceplates shall be provided where required. The homerun from each outlet to the backboard shall consist of one RG-6 cable in 1 inch conduit. In buildings with cable trays, the cable tray shall be utilized for the CATV cabling in the same manner as for communication cabling. Each cable shall terminate at a type 'F' connector. At the backboard, the cable shall terminate on splitters. All CATV head-end equipment, incoming service, etc. shall be furnished and installed by the local CATV company. A dedicated area on the communications room/closet backboard shall be utilized for the CATV system. Enough space shall be clear to accommodate equipment to be provided by the local CATV company. Within this dedicated area a #6 AWG bare solid copper conductor in 3/4 inch conduit shall be provided between the backboard and the building's primary grounding system. 10 feet of slack shall be provided coiled up on backboard.

33.5.2 CATV outlets shall be mounted 18-inches AFF unless otherwise indicated. CATV outlets and faceplates shall be white.

33.5.3 All empty conduit shall be sealed, capped and tagged and shall include a pull wire.

33.6 Fire Alarm and Detection System

33.6.1 The fire alarm reporting, evacuation and detection systems for all facilities shall be provided where required by and designed in accordance with the UFC 3-600-01, 2003 (http://www.ccb.org/docs/UFC/3_600_01.pdf), the International Building Code, 2003, and the National Fire Protection Association (NFPA), NFC Codes and Standards, current as of 2004.

33.6.2 The design of the fire detection features shall be by a qualified fire protection engineer meeting one of the following conditions: a.) An engineer with a Bachelor of Science or Masters of Science Degree in fire protection engineering from an accredited university engineering program, plus a minimum of 5 years' work experience in fire protection engineering. b.) A registered professional engineer who has passed the National Council of Examiners for Engineering and Surveys (NCEE) fire protection engineering written examination. c.) A registered P.E. in a related engineering discipline with a minimum of 5 years' experience dedicated to fire protection engineering. d.) An individual who has obtained National Institute for Certification in Engineering Technologies, Fire Alarm Systems, Level III certification (minimum) in accordance with NFPA 72.

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33.6.3 A fire protection and life safety design analysis addressing fire alarm reporting, evacuation and detection systems shall be provided for all buildings in the project as described in "Fire Protection" paragraph herein.

33.6.4 Where fire alarm reporting, evacuation and detection systems are determined to be required, they shall comply with the following:

33.6.4.1 The fire alarm systems shall consist of control panels, RF receiver/transmitters and antenna, manual pull stations, horns and visual indicators, sprinkler water flow switches, valve tamper switches, air pressure supervisory switches, control and monitor modules for non-addressable devices and smoke (including duct detectors) and heat detectors. Fire alarm system for all buildings shall comply with the Americans with Disabilities Act (ADA).

33.6.4.1.1 All Fire Alarm Panels locks and Pull Stations reset keys shall be keyed to be Cat-15. Fire Alarm transmitters shall remain factory keyed.

33.6.4.2 Provide horns throughout the facilities to attain alarm sound levels of no less than 15 dB above normal ambient sound levels at any location within the facilities. Normal ambient sound levels shall include the sound of shower water running. Provide visual indicators in compliance with the ADA (except not required in barracks) and NFPA 72: National Fire Alarm Code.

33.6.4.3 The fire alarm and detection system shall be a complete, supervised fire alarm reporting system. The system shall be activated into the alarm mode by actuation of any alarm initiating device. The system shall remain in the alarm mode until the initiating device is reset and the fire alarm control panel is reset and restored to normal. Alarm initiating devices shall be connected, Style D, to signal line circuits (SLC), Style 6, in accordance with NFPA 72. Alarm notification appliances shall be connected to notification appliance circuits (NAC), Style Z in accordance with NFPA 72. A looped conduit system shall be provided so that if the conduit and all conductors within are severed at any point, all IDC, NAC and SLC will remain functional. The conduit loop requirement is not applicable to the signal transmission link from the local panels (at the protected premises) to the Supervising Station (fire station, fire alarm central communication center). Textual, audible, and visual appliances and systems shall comply with NFPA 72. Fire alarm system components requiring power, except for the control panel power supply, shall operate on 24 Volts dc. Addressable system shall be microcomputer (microprocessor or microcontroller) based with a minimum word size of eight bits. Detection, monitor and control device shall be individually addressable. Devices not inherently addressable (e.g., tamper and flow switches) shall be equipped with addressable monitor and control modules.

33.6.4.4 Vertical and horizontal separation of conduits shall be in accordance with NFPA 72. Conduits shall be red or marked with a red stripe every 10 feet. All junction boxes and pull boxes shall be painted red.

33.6.4.5 A dedicated power supply shall be provided for the fire alarm panel. The power supply shall be equipped with a locking mechanism and marked in red with the words "FIRE ALARM CIRCUIT CONTROL".

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33.6.4.6 Tamper switches shall be provided on all fire alarm system control valves and the Post Indicator Valves (PIV). Coordinate with the other disciplines to determine locations.

33.6.4.7 RF receiver/transmitters shall be Monaco BT-X @139.675MHZ and shall be compatible with proprietary supervising station receiving equipment. Each radio alarm transmitter shall be the manufacturer's recognized commercial product, completely assembled, wired, factory tested, and delivered ready for installation and operation. Transmitters shall be provided in accordance with applicable portions of NFPA 72, NFPA 1221, and 47 CFR 15. Transmitter electronics module shall be contained within the physical housing as an integral, removable assembly. The proprietary supervising station receiving equipment is MONACO D-700 and the transceiver shall be fully compatible with this equipment. At the contractors option, and if UL listed, the transmitter may be housed in the same panel as the fire alarm control panel. Fire alarm control panels and transmitters shall be equipped with 72 hour battery back-up power.

33.6.4.8 Horns shall be surface mounted, with the matching mounting back box recessed vibrating type suitable for use in an electrically supervised circuit. Horns shall produce a sound rating of at least 85 dBA at 10 feet. Horns used in exterior locations shall be specifically listed or approved for outdoor use and be provided with metal housing and protective grilles. Horns shall be capable of being turned off by the mass notification system. When that occurs a supervisory signal shall be transmitted to the fire department.

33.6.4.9 Visual indicators shall conform to the applicable requirements of UL 1971. Appliances shall have clear high intensity optic lens, xenon flash tubes, and output white light. Strobe flash rate shall be between 1 to 3 flashes per second and a minimum of 75 candela. Strobe shall be semi-flush mounted.

33.6.4.10 An omnidirectional, coaxial, halfwave dipole antennas for radio alarm receiver/transmitters with a driving point impedance to match receiver/transmitter output shall be provided. The antenna and antenna mounts shall be corrosion resistant and designed to withstand wind velocities of 100 mph. Antennas shall not be mounted to any portion of the building roofing system.

33.6.4.11 Smoke detectors shall be designed for detection of abnormal smoke densities. Smoke detectors shall be photoelectric type. Detectors shall contain a visible indicator LED/LCD that shows when the unit is in alarm condition. Detectors shall not be adversely affected by vibration or pressure. Detectors shall be the plug-in type in which the detector base contains terminals for making wiring connections. Detectors that are to be installed in concealed (above false ceilings, etc.) locations shall be provided with a remote indicator LED/LCD suitable for mounting in a finished, visible location.

33.6.4.11.1 Photoelectric detectors shall operate on a light scattering concept using an LED light source. Failure of the LED shall not cause an alarm condition. Detectors shall be factory set for sensitivity and shall require no field adjustments of any kind. Detectors shall have an obscuration rating in accordance with UL 268. Addressable smoke detectors shall be

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capable of having the sensitivity being remotely adjusted by the control panel.

33.6.4.11.2 Duct-mounted photoelectric smoke detectors shall be furnished and installed where indicated and in accordance with NFPA 90A. Units shall consist of a smoke detector as specified in paragraph Photoelectric Detectors, mounted in a special housing fitted with duct sampling tubes. Detector circuitry shall be mounted in a metallic enclosure exterior to the duct. Detectors shall have a manual reset. Detectors shall be rated for air velocities that include air flows between 500 and 4000 fpm. Detectors shall be powered from the fire alarm panel. Sampling tubes shall run the full width of the duct. The duct detector package shall conform to the requirements of NFPA 90A, UL 268A, and shall be UL listed for use in air-handling systems. The control functions, operation, reset, and bypass shall be controlled from the fire alarm control panel. Lights to indicate the operation and alarm condition; and the test and reset buttons shall be visible and accessible with the unit installed and the cover in place. Detectors mounted above 6 feet and those mounted below 6 feet that cannot be easily accessed while standing on the floor, shall be provided with a remote detector indicator panel containing test and reset switches. Remote lamps and switches as well as the affected fan units shall be properly identified in etched plastic placards. Detectors shall have auxiliary contacts to provide control, interlock, and shutdown functions. The detectors shall be supplied by the fire alarm system manufacturer to ensure complete system compatibility.

33.6.4.11.3 Combination smoke and heat detectors shall have an audible device (self-contained) and be designed for detection of abnormal smoke densities by the photoelectric principle and abnormal heat by a fixed temperature sensor. Smoke detectors shall be provided with an LED light source. Failure of the LED shall not cause an alarm condition and the sensitivity shall be factory set at a nominal 3 percent and require no field adjustments of any kind. Heat detector portion shall be fixed temperature sensor rated at 135 degrees F. The audible appliances shall have a minimum sound output of at least 85 dBA at 10 feet. Detectors shall contain a visible indicator LED that shows when the unit is in alarm condition. Detectors shall not be adversely affected by vibration or pressure. Heat detectors shall connect to a control panel SLC and shall be self restorable.

33.6.4.12 Manual Pull Fire Alarm Stations shall not use glass rods.

33.7 Mass Notification System (MNS)

A MNS shall be provided in each inhabited building in accordance with UFC 4-021-01, Design and O&M: Mass Notification Systems (<http://www.hnd.usace.army.mil/techinfo/UFC/UFC4-021-01.pdf>), to provide real-time information to all building occupants and personnel in the immediate vicinity of the building during emergency situations. For purposes of determining the need for an MNS, an inhabited building is defined as a building or portions of a building routinely occupied by 11 or more DoD personnel and with a population density of greater than one person per 430 gross square feet.

33.7.1 The MNS shall be designed and installed by personnel factory-trained by the MNS manufacturer. MNS products shall be from a manufacturer with no

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less than 5 years of experience in producing products similar to those required for mass notification. Upon completion of installation, MNS performance tests shall be completed demonstrating compliance with the requirements herein using test procedures and forms approved by the Contracting Officer's Representative. The Contracting Officer's Representative shall witness performance test and final acceptance test. Upon successful completion of acceptance tests, six (6) complete sets of record drawings and operations and maintenance manuals shall be provided.

33.7.2 The MNS shall consist of a notification appliance network and an autonomous control unit. The autonomous control unit shall be placed in the communications room/closet a wall without the backboard. The MNS shall be independent of the fire alarm system. All MNS components shall be suitable for the environment in which they are installed.

33.7.2.1 The notification appliance network consists of a set of audio speakers located to provide intelligible instructions at all locations in and around the building. The speakers shall be mounted both interior and exterior to the building. Visual strobes separate from fire alarm visual indicators shall also be provided to alert hearing-impaired occupants in buildings designated handicap accessible. Strobes shall be un-marked, with amber colored lenses. Audio speakers shall comply with the requirements for speaker intelligibility in accordance with NFPA 72, Appendix A; and visual strobes shall comply with the requirements for fire alarm visual indicators contained therein.

33.7.2.2 The autonomous control unit shall monitor and control the notification appliance network. A local operator console shall be provided in each facility and connected to the autonomous control unit for local operation. Using the local operator console, building personnel shall initiate delivery of pre-recorded voice messages, provide live voice messages and instructions, and initiate visual strobes (where applicable). Location of local operator console shall be as directed by Ft. Hood DPW during design. The local operator control shall be a separate unit from the autonomous control unit.

33.7.2.2.1 The autonomous control unit shall temporarily deactivate audible fire alarm notification appliances while delivering voice messages. Activation of fire alarm visual indicators and transmission of signals to the base fire department shall not be affected by activation of the MNS. NFPA 72 prohibition against deactivation of fire alarm audible notification appliances is waived to allow MNS override capability.

33.7.2.2.2 Upon deactivation of the audible fire alarm notification appliances, a supervisory signal separate from other fire alarm supervisory signals shall be displayed at the building fire alarm control panel and the supervisory signal shall be transmitted to the base fire department. A readily accessible means shall be provided for emergency response forces to manually override the deactivation function, permitting the fire alarm audible notification appliances to operate independently of the MNS. Use of the manual override feature shall cause a supervisory signal in the fire alarm system.

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33.7.2.2.3 Autonomous control unit monitoring capabilities shall include conductor integrity for strobe, display, fire alarm interface and speaker wiring. The autonomous control unit shall display and log local diagnostic information and shall be capable of repeating pre-recorded messages until terminated.

33.7.2.3 A central control unit shall be provided at the barracks site to allow broadcasting of instructions to all barracks buildings within the site from a single location. The central control unit shall communicate with the autonomous control units transmit commands and messages and receive status information. The central control unit capabilities shall include the following:

33.7.2.3.1 Remotely activate all functions of the individual building systems, including delivery of pre-recorded voice messages.

33.7.2.3.2 Remotely activate concurrent pre-recorded voice messages to multiple individual building systems, including one message for the affected building and a separate message for nearby unaffected buildings.

33.7.2.3.3 Deliver live and recorded voice messages to individual building systems.

33.7.2.4 The communications network shall provide two-way communications between the central control unit and autonomous control units, and shall include redundant (primary and backup) communication links.

33.7.2.5 The MNS shall include 8-hour battery back-up.

33.8 Intrusion Detection System (IDS)

33.8.1 The IDS system shall consist of an empty conduit and box system for Government-furnished and Government-installed (GFGI) IDS equipment. Two 4-inch square (2-1/8 inches deep) junction boxes shall be provided in the protected area at the ceiling level on the wall adjacent to the door. Extend one 1-inch conduit from one of the boxes to the nearest telephone board. Provide a branch circuit in the other box and connect to a panelboard. Provide a red pad-lockable circuit breaker for the IDS power. Power and communication conduits for the IDS shall be galvanized rigid steel run exposed with all the joints welded.

33.8.2 All empty conduit shall be sealed, capped and tagged and shall include a pull wire.

33.8.3 An empty conduit and box IDS system shall be provided in each Modular Documents Vault (if provided).

34. SITE ELECTRICAL DESIGN

34.1 Codes and Standards

The design and construction of the electrical systems shall be in compliance with the most recent editions of the applicable National Fire Protection

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Association Standards, the rules and recommendations of IEEE C2: National Electric Safety Code, UFC 3-550-03N, Design: Power Distribution Systems (http://www.ccb.org/docs/UFC/3_550_03.pdf), and as required herein. Where there is a conflict between the RFP and the codes and standards the most stringent shall apply.

34.2 Site Electrical

Primary power shall be extended to all sites. Specific facility locations shall be as shown on civil sheets. Existing aerial feeders shall be utilized as primary connection points for each site. These feeders are shown **(AM #0002) by attachments provided in Appendix E ELECTRICAL REQUIREMENTS** ~~for on attachment 3E for storage facility and attachment 4E(Bid Option #1) for classroom facility.~~ Available fault current data is also shown for each feeder. Primary extension off-site shall be aerial. Primary extension on-site shall be underground. Aerial primary extensions shall be 3-phase, 4-wire unless noted otherwise. Underground primary extensions to 3-phase electrical equipment shall be 3-phase, 3-wire with cable shield sized to accommodate fault current without damage to the conductor (except at the location of the fault) in accordance with IEEE C2. A separate 600 volt ground wire shall be installed in the duct with the primary extension. In lieu of a ground wire, concentric neutral cable may be utilized.

34.2.1 The existing primary power distribution system at Fort Hood is 7200/12470 volts, three-phase, four-wire, grounded wye. **(AM #0002) The TVM shops shall have installed a pole-mounted transformer bank consisting of 3-15 kVA, 277-480V secondary transformer with #2 THW ACSR quadraplex service drop to shop's service entrance panel "PP".** New class 3 riser poles with fused cutouts, lightning arrestors, and cable terminators shall be provided for both **(Amn#0002) pole-mounted transformers and** transition from aerial to underground service. Power lines for extension of primary aerial service to the sites (if required) shall consist of wood poles and crossarms. Contractor shall match the type of aerial construction utilized at Ft. Hood. The underground primary duct system shall consist of no less than two 4-inch ducts. One duct shall house the phase conductors and the other duct shall act as a spare. The duct system shall be placed a minimum of 36 inches below grade and shall be concrete encased. A pull wire shall be provided in all empty ducts. Cable junctions shall only be in sectionalizing cabinets and primary switches. No splices in manholes shall be allowed.

34.2.2 Scheduled primary outages are not allowed on Ft. Hood. Therefore, all connections to existing lines shall be accomplished while the lines energized.

34.2.3 All pad-mounted transformers shall be rated for three-phase service, connected delta-wye. Medium-voltage ratings of cable terminations shall be 15 kV between phases for 133 percent insulation level. Pad-mounted transformers shall comply with ANSI C57.12.26 and shall be of the radial or loop feed type. Pad-mounted transformer stations shall be assembled and coordinated by one manufacturer and each transformer station shall be shipped as a complete unit so that field installation requirements are limited to mounting each unit on a concrete pad and connecting it to primary and secondary lines. Stainless steel pins and hinges shall be provided. Barriers shall be provided between high- and low-voltage compartments. High-voltage compartment doors shall be interlocked with low-voltage compartment doors to prevent access to any high-voltage section unless its associated low-voltage section door has first been opened. Compartments shall be sized to meet the specific dimensional

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requirements of ANSI C57.12.26. Pentahead locking bolts shall be provided with provisions for a padlock.

34.2.3.1 The high-voltage compartment shall be dead-front construction. Primary switching and protective devices shall include load break switching, oil-immersed, bayonet-type, overload fuse in series with a partial range current-limiting fuse, medium-voltage separable load break connectors, universal bushing wells and inserts or integral one piece bushings and surge arresters. The switch shall be mounted inside transformer tank with switch operating handle located in high-voltage compartment and equipped with metal loop for hook stick operation. Fuses shall be interlocked with switches so that fuses can be removed only when the associated switch is in the "OPEN" position. Adjacent to medium-voltage cable connections, a nameplate or equivalent stenciled inscription shall be provided inscribed "DO NOT OPEN CABLE CONNECTORS UNLESS SWITCH IS OPEN." Surge arresters shall be fully insulated and configured to terminate on a second set of high voltage bushings.

34.2.3.2 Radial-feed load break switches shall be oil-immersed type rated at 15 kV, 95 kV BIL, with a continuous current rating and load-break rating of 200 ampere, and a make-and-latch rating of 10,000 rms amperes symmetrical. Locate the switch handle in the high-voltage compartment. Provide three, two-position, oil-immersed type loop feed sectionalizer switches to permit closed transition loop feed and sectionalizing. Each switch shall be rated at 15 kV, 95 kV BIL, with a continuous current rating and load-break rating of 200 amperes, and a make-and-latch rating of 10,000 rms amperes symmetrical. Locate the switch handle in the high-voltage compartment. Operation of switches shall be as follows:

ARRANGEMENT #	DESCRIPTION OF SWITCH ARRANGEMENT	SWITCH POSITION		LINE B SW		XFMR SW	
		LINE A SW	OPEN CLOSE	OPEN CLOSE		OPEN CLOSE	
1	Line A connected to Line B and both lines connected to transformer		X		X		X
2	Transformer connected to Line A only		X	X			X
3	Transformer connected to Line B only	X			X		X
4	Transformer open and loop closed		X		X	X	
5	Transformer open and loop open	X		X		X	

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34.2.3.3 Transformers shall comply with IEEE ANSI/IEEE C57.12.00, ANSI C57.12.21, and ANSI C57.12.26 and shall be of the mineral oil-insulated type. Transformers shall be suitable for outdoor use and shall have 2 separate windings per phase. Standard NEMA primary taps shall be provided. Where primary taps are not specified, 4, 2-1/2 percent rated kVA high-voltage taps shall be provided 2 above and 2 below rated, primary voltage. Operating handles for primary tap changers for de-energized operation shall be located within high-voltage compartments, externally to transformer tanks. Adjacent to the tap changer operating handle, a nameplate or equivalent stenciled inscription shall be provided and inscribed "DO NOT OPERATE UNDER LOAD." Transformer temperature rise at 60 Hz shall be 60 degrees C.

34.2.4 In transformer low-voltage cable compartments, neutrals shall be provided with fully-insulated bushings. Clamp type cable terminations, suitable for copper or aluminum conductors entering from below, shall be provided as necessary.

34.2.5 Electrical equipment such as pad-mounted transformers, sectionalizing cabinets and primary switches shall be inconspicuously located. No such equipment shall be located within 33 feet of buildings to meet force protection requirements. All pad mounted medium voltage equipment shall be dead-front.

34.2.6 Electrical manholes shall be 6 feet long by 4 feet wide by 6 feet deep (interior dimensions). Strength of manholes and their frames and covers shall conform to the requirements of IEEE C2. Precast-concrete manholes shall have the required strength established by ASTM C 478, ASTM C 478M. Frames and covers shall be made of gray cast iron and a machine-finished seat shall be provided to ensure a matching joint between frame and cover. Cast iron shall comply with ASTM A 48, Class 30B, minimum.

34.2.7 Cathodic protection shall be provided for all metal piping, conduit and equipment installed below grade. Design shall be in accordance with TM 5-811-7, Electrical Design, Cathodic Protection (<http://www.usace.army.mil/inet/usace-docs/armymtm/TM5-811-7/>). Protection system shall be sacrificial type utilizing magnesium anodes, and shall have a design current of 2 ma per square foot of bare metal.

34.2.8 Secondary and service conductors shall be installed in conduit and shall be placed a minimum of 24 inches below grade.

34.2.9 Medium voltage cable construction shall be Type MV, conforming to NFPA 70 and UL 1072. Cables shall be manufactured for use in duct applications. Cables shall be soft drawn copper complying with ASTM B 3 and ASTM B 8 for regular concentric and compressed stranding or aluminum alloy 1350, 3/4 hard minimum complying with ASTM B 609, ASTM B 609M and ASTM B 231 for regular concentric and compressed stranding. Cable insulation shall be cross-linked thermosetting polyethylene (XLP) insulation conforming to the requirements of NEMA WC 7 and AEIC CS5 or ethylene-propylene-rubber (EPR) insulation conforming to the requirements of NEMA WC 8 and AEIC CS6. A 133 percent insulation level shall be used on 15 kV rated cables. Cables shall have a semiconducting conductor shield, a semiconducting insulation shield, and an overall copper wire shield for each phase. Cables shall be provided with a polyethylene jacket.

34.3 Not Used

34.4 Utility Routing

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34.4.1 Underground power ducts crossing existing roads shall be jacked and bored.

34.4.2 The installation of underground power lines shall be coordinated with all other utilities including but not be limited to: communications, storm drains, sanitary sewers, water lines, high temp water lines, chilled water lines and gas lines. The minimum separation between electric or communication lines and other utility lines shall be 36 inches vertically and 36 inches horizontally when running adjacent. If utilities are crossing, minimum separation shall be 12 inches vertically. In the case of concrete encasement, the clearances shall be measured from the outermost dimension of the utility line and shall have suitable supports on each side of the upper line to prevent transferring any direct load onto the lower line.

34.4.3 Prior to commencing work on any new underground power line, the Contractor shall stake the route of each line and indicate the exact location of all new ducts, primary sectionalizing cabinets, primary switches, manholes and transformers for approval by the Fort Hood DPW, Ft. Hood DOIM, and by the Contracting Officer's Representative.

34.4.4 New underground utilities including manholes and handholes shall be located outside the tree drip lines of existing trees scheduled to remain. Ducts that cannot be routed around tree drip lines shall be tunneled through the drip line area as approved by the Contracting Officer's Representative.

34.4.5 See paragraph 16 herein for additional utility layout requirements.

34.5 Grounding

The secondary electrical distribution system shall be the solidly grounded neutral type with no intentionally introduced grounding impedance. Grounding shall be in accordance with Article 250, National Electrical Code.

34.5.1 A grounding counterpoise shall be provided around each transformer pad. Ground rods shall be provided at each corner of the pad and connected to the counterpoise. Connections shall be by exothermic weld.

34.5.2 Resistance of driven grounding electrodes shall be tested by the fall-of-potential method. Resistance of the grounding systems shall be a maximum of 25 ohms. The Contracting Officer's Representative shall be immediately notified of resistance readings exceeding 25 ohms.

34.5.3 Grounding conductors shall be copper. Driven grounding electrodes shall be 3/4 inch diameter x 10 feet long solid rods of the following materials: copper or copper-clad steel.

34.5.4 Grounding and bonding shall conform to UL 467.

34.5.5 All pole line hardware shall be grounded in accordance with IEEE C2.

34.6 Metering

34.6.1 Watt-hour meters shall comply with ANSI C12.1 and ANSI C12 and shall be pulse initiator type or electronic type with a pulse output. The meter shall be capable of operating at speeds up to 500 pulses per minute with no false pulses, provide a pulse output of one pulse per kilowatt-hour, and is field programmable. If software or programming device is required, it should

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be supplied with meter. Registers of meters that have an additional non-digital display for kilowatt demand shall be pointer-type.

34.6.2 An automatic meter reading system (AMRS) to monitor electricity, gas, and water usage from building 4219 shall be provided for all facilities. Guide specification 13815, Automated Meter Reading System is included in this RFP and shall be utilized for this system.

34.6.3 Fort Hood utilizes an Automatic Meter Reading System (AMRS), manufacturer by Teldata Solutions, to monitor electricity, gas, and water usage. The system consists of a central computer (located in Bldg. 4219) and numerous field devices called Meter Interface Units (MIU). The MIU is capable of connecting to and recording information from up to four different utility meters of various types. The recorded information can be either an encoded signal or a pulse signal. The MIU has a built-in modem that is used to transmit the recorded information to the central computer (via the telephone system) base on a preprogrammed schedule. The recommended model is the DC-4 which is battery powered with an approximately life of 15 years. The DC-4 must be requested with dual (two) PB-01 boards that are required to record pulse-type signals. When data logging is required, the IX-4D is recommended.

34.6.4 The MIU shall be installed (with associated wiring) in accordance with manufacturer's recommendation. The MIU shall be located inside the facility as close as possible to the servicing telephone block. However, the total distance from the MIU to any utility meter shall not be more than 500 feet. Communication cable shall be installed between the meter(s) and the MIU. Cable shall be #22 AWG, solid, shielded, three wire (color-coded: red, green, and black), with 600VAC insulation and PVC outer jacket installed in conduit. Allow a 1-2 feet pigtail at the MIU and the connected meter(s) for subsequent connection. A telephone outlet shall be installed adjacent to the MIU and telephone cable shall be installed to the backboard or patch panel. Due to the special setup requirements, the Fort Hood staff will make final cable connection(s) to the MIU and the meter(s), to include programming the MIU and connection to the telephone system (254-287-7283).

34.6.5 The Teldata Solutions utilizes proprietary type protocol that has been developed for particular encoder-type meters that are typically utilized for gas and water meters (Note: all water meters shall be encoded-type. Also, some electrical meters are capable of providing an encoded signal. The encoded signal is the preferred choice because of the addition data it supplies (i.e. serial number, tampering information, etc). On the other hand a pulse signal is limited to only providing a digital signal (on/off). However, when an encoded-type meter is not available, the minimum pulse requirement is as stated in paragraph 29.7.1.

34.6.6 Current Transformer (CT) rating for metering shall be based on the service rating, mission of the facility, and minimum (base) load to provide the best overall accuracy of the load being measured. Per CT performance curves, meters should be accurate down to 5% of the CT rating. For loads exceeding 1000A, submetering or check metering system shall be considered. The following table is provided to indicate suggested CT ratings.

<u>SUGGESTED CT RATINGS</u>					
Service Capacity	CT Rating	Accuracy Class	RF	Max Load	Min Load
225A	200/5	.3 thru B-0.1	4.0	800A	10A
300A	300/5	.3 thru B-0.2	3.0	900A	15A

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400A	200/5	.3 thru B-0.1	4.0	800A	10A
600A	400/5	.3 thru B-0.2	4.0	1600A	20A
800A	400/5	.3 thru B-0.2	4.0	1600A	20A
1000A	600/5	.3 thru B-0.5	3.0	1800A	30A
1200A	600/5	.3 thru B-0.5	3.0	1800A	30A
1500A	800/5	.3 thru B-0.5	2.0	1600A	40A
1800A	1500/5	.3 thru B-0.9	1.5	2250A	75A
2000A	1500/5	.3 thru B-0.9	1.5	2250A	75A
2500A	2000/5	.3 thru B-1.8	1.5	3000A	100A
3000A	3000/5	.3 thru B-1.8	1.33	3990A	150A

34.6.7 The MIUs can be obtained from [Teldata Solutions](#), First Point, 1001 SW Fifth Ave, Suite 500, Portland OR 97204, (503) 425-5100 ext. 5127. Utility meter(s) can be supplied from various metering vendors. A list of tested compatible meters may be obtained from the Ft. Hood DPW Energy Management Team, (254) 287-7283.

34.7 (AM #0002) Exterior Lighting

34.7.1 Design of the exterior lighting system and selection of target illumination levels and uniformity ratios not indicated herein shall comply with the recommendations of the Illuminating Engineering Society (IES) Lighting Handbook, 9th Edition. Exterior luminaires shall have full cutoff light distribution patterns as defined in Chapter 22 of the IES Lighting Handbook and shall be individually fused. Exterior lighting shall be provided for Site 2 (LZ Phantom), Site 3 (49000 block), Site 6 (Motor Pool), Building 4615, & Building 4617 hardstands. All exterior lighting shall utilize pulse-start high pressure sodium or metal halide lamps and ballasts. Hardstand lighting shall be served by photocell controlled, zoned lighting contactors. Each contactor/zone shall be equipped with Hand-Off-Auto switches. Controls shall be inconspicuously located in NEMA 3R enclosures. Locations, enclosures and mounting methods shall be approved by the Contracting Officer's Representative prior to installation.

34.7.2 Hardstand areas shall be illuminated to 0.5 foot-candle using full cutoff photocell-controlled floodlight luminaires mounted on metal poles. Highmast lighting is to be used for Site 3 (49000 block) & Site 6 (Motor Pool). It is preferable to locate fixtures along the perimeter, but if uniformity cannot be achieved then poles may be placed within the hardstand, but must be properly protected from vehicle damage. Highmast light locations shall be approved by Directorate of Aviation Operations. Lamps shall not exceed 400 watts.

34.7.3 Poles shall be aluminum or steel, and shall be the pole manufacturer's standard design for supporting the number of fixtures provided. Poles shall be round in shape. Rectangular poles are unacceptable. Poles shall be designed for a wind velocity of 70 mph at the base of the pole, for a wind gust factor of 1.3, and for the height and drag factors recommended by AASHTO LTS-4. The effective projected area of luminaires and other pole-mounted

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devices shall be taken into account in pole design. Poles shall have grounding provisions. The type of pole shaft material provided shall not be mixed for the same type of fixture types. Grounding connection shall be provided near the bottom of each metal pole and at each concrete pole anchor base. Scratched, stained, chipped, or dented poles shall not be installed.

34.7.4 Poles shall be mounted on concrete foundations with anchor bolts provided by the pole manufacturer. Foundations shall be sized for the loading. Poles located in turf or landscaped areas shall be mounted on concrete foundations extending 2 inches above finished grade (AFG). Poles located in hardstand areas shall be mounted on 30-inch round concrete pedestals extending no less than 36 inches AFG.

34.7.5 Exterior lighting shall utilize 480 volts as much as possible.

34.8 Site Communications

34.8.1 Specific facility locations shall be as shown on civil sheets. Location of other facilities indicated herein are indicated by attachments provided in Appendix E ELECTRICAL REQUIREMENTS.

34.8.1 New ducts installed underneath vehicular streets shall be jack and bored. Handholes shall be 3 x 4 x 4 feet minimum and may be utilized on any site to facilitate the distribution of cabling. Handholes shall not be installed in areas subject to vehicular traffic and shall not be used as part of off-site duct systems. Ducts shall be sealed, capped and tagged in handholes.

34.8.2 New concrete manholes shall be 6' wide x 8' long x 7' deep. Manholes shall be equipped with pulling-in irons, cable racks, and ground rod, and conform to the requirements of REA Bulletin 345-151. Manholes shall be designed so that the main trunk conduits enter and exit near the center of the ends, and lateral conduits exit on the sides near the corners. Manholes may be pre-cast or cast in place. Maximum distance between manholes shall be 500 feet. When new ducts are required to penetrate existing manholes, the manholes shall be core drilled and ducts shall be extended into manholes and sealant applied between the manhole and the duct. If fiber optic splicing is required in manholes, then 50 feet of slack per splice shall be provided as required by RUS REA Bulletin 1735F.

34.8.3 The following are the outside cable plant requirements per building type. Barracks shall be provided with 12 PR copper. Dayrooms shall be provided with 6 PR copper. Bn HQ's shall be provided with 200 PR copper and 24 strand FO. Company ops shall be provided with 50 PR copper and 12 strand FO. Company ops supply facilities shall be provided with 4 PR copper. Stand alone classrooms shall be provided with 25 PR copper and 12 strand FO. Maintenance shops shall be provided with 12 PR copper. Administration buildings shall be provided with 50 PR copper and 12 strand FO. Arms rooms shall be provided with 6 PR copper. Unit storage (17,000 block only) shall be provided with 12 PR copper. All copper and fiber optic cabling from the service point of origin to the individual sites shall be based on the total requirements of the site. For example, if there are sixteen company ops buildings on a site then contractor shall provide as a minimum 800 pairs (50 PR x 16) of cable to the site, and 192 strands (12 strand x 16) of FO cable to

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the site. Arms rooms do not figure into these calculations because they will be fed from company ops buildings.

34.8.4 The following work shall be accomplished to provide service to and on the 4900 and 49000 block site. Service shall be obtained from Bldg. 4304. See Attachment 21E for location of Bldg. 4304 and the 4900 and 49000 Blk. There is an existing manhole on the NW corner of 77th St. and Warehouse Ave. A 4-way 4-inch concrete encased duct system (one duct with 4-1" inner ducts) shall be provided from this manhole. Duct system shall traverse westward along Warehouse Ave. to the west side of 80th St. where a manhole shall be provided at the NW corner of 80th St. and Warehouse. A minimum of two other manholes shall be provided to ensure the maximum distance between manholes does not exceed 500 feet. Duct system shall be jack and bored under 78th, 79th, and 80th streets. From the new manhole on the NW corner of 80th St. and Warehouse a 4-way 4-inch concrete encased duct system (one duct with 4-1" inner ducts) shall be provided along 80th St to the NW corner of 80th and Sante Fe where another manhole shall be placed. An additional manhole shall be placed and centered between these two manholes. This manhole shall be used to feed the new maintenance shop and administration building located on the east side of the site. From the manhole located on the NW corner of 80th St. and Sante Fe four more manholes shall be placed to the west along Sante Fe Ave. 500 feet apart from each other on center. These manholes shall be interconnected with a 4-way 4-inch concrete encased duct system (one duct with 4-1" inner ducts). The two maintenance shops on the west side of the site shall be fed from the farthest western placed manhole. Service from the manholes shall be direct buried. There are existing spare ducts that can be used between Bldg. 4304 and the manhole on the corner of 77th St. and Warehouse. Provide 300PR copper cable to the new manhole providing service to the admin building. Provide 60 strand FO cable to same manhole. From that manhole to the westernmost manhole being provided along Sante Fe Ave. provide 200 PR copper and 48 strand FO cable. These cables shall be spliced into the 300 PR cable and 60 strand cable respectively. Work inside Bldg. 4304 shall include providing Avaya fiber high density distribution panels C.C. 700-007-214 LST1U-144/9 to terminate 60 strand FO cable. In addition, provide and mount new Reltec C-388 protector blocks on existing main distribution frame and terminate 300 PR copper cable on these blocks.

34.8.5 Service to site 2 (LZ Phantom) shall be obtained by extending a new duct system to the existing manhole shown on attachment 22E. Fiber and copper shall be spliced in the existing manhole.

34.8.6 Service to Site 1 (DOL Area) shall be obtained by extending fiber and copper to communications room in building 89010 located adjacent to site.

34.8.7 The following work shall be accomplished to provide service to site 20 (Tank Destroyer & 78th). Service shall be obtained from Bldg. 4304. See Attachment 23E. There is an existing manhole on the NW corner of 77th St. and Warehouse Ave. A 4-way 4-inch concrete encased duct system (one duct with 4-1" inner ducts) shall be provided from this manhole. There are existing spare ducts that can be used between Bldg. 4304 and the manhole on the corner of 77th St. and Warehouse. Work inside Bldg. 4304 shall be as indicated for the 4900 and 49000 block site.

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34.8.8 The following work shall be accomplished to provide service to and on the 3500 block site. Service shall be obtained from Bldg. 36000 (Darnall hospital). See Attachment 24E for location of Bldg. 36000 and the 3500 Blk. There is an existing manhole located on the southwest corner of 58th St. and Darnall loop. From this manhole a new 4-way 4-inch concrete encased duct system shall be placed under 58th St. by jacking and boring. From the first new manhole on the east side of 58th St., a new 2-way 4-inch concrete encased duct system (one duct with 4-1" inner ducts) shall be provided to a new handhole located adjacent to the communication distribution node building. The ducts shall continue from the handhole into the building and stub up adjacent to a wall. In addition, four spare 4" conduits shall be provided between the handhole and the building. They shall be stubbed up adjacent to the other two ducts inside the building. From the manhole on the corner of 58th St. and Darnall loop provide a 4-way 4-inch concrete encased duct system (one duct with 4-1" inner ducts) parallel to the existing duct system heading back west along Darnall loop and then heading south terminating inside Bldg. 36000. Ducts shall be core drilled into two more manholes along this path and into Bldg. 36000. Ducts shall be jack and bored underneath Darnall loop. From the distribution node building the contractor has the option of providing service to the new buildings on site either underground or aurally. If underground, then contractor shall follow the same requirements provided for the 800 block. If aerial, then a single copper and a single fiber optic cable, sized to provide unique homerun service to all buildings, shall leave the distribution node building underground and traverse to a riser pole. From the riser pole cabling shall be distributed throughout the site aurally including service drops. Each service drop shall be individually spliced off of the main cable. As buildings are fed, main cable will reduce in size by the number of pairs or strands provided in the drop. It is preferred that aerial distribution be utilized. Work inside Bldg. 36000 shall include providing Avaya fiber high density distribution panels C.C. 700-007-214 LST1U-144/9 to terminate outgoing fiber optic cabling. Number and size of panels shall be sufficient to terminate all outgoing strands.

34.8.9 The following work shall be accomplished to provide service to and on the 800 block site. Service shall be obtained from Bldg. 11002 (RSC-3). See Attachment 25E for location of Bldg. 11002 and the 800 Blk. There is an existing manhole across the street from Bldg. 9211 on the west side of 21st St. that shall be the connection point for a 2-way 4-inch concrete encased duct system (one with 4-1" inner ducts) that shall be provided to a new handhole. The handhole shall be located adjacent to the communication distribution node building located on the site. The ducts shall continue from the handhole into the building and stub up adjacent to a wall. In addition, four spare 4" conduits shall be provided between the handhole and the building. They shall be stubbed up adjacent to the other two ducts inside the building. If the length of the new duct system exceeds 500 feet, a minimum of one new manhole shall be provided per requirement stated elsewhere in RFP. North of the existing manhole on 21st St. is another manhole. These two manholes have spare ducts between them that can be utilized for new cabling. Between the northernmost of the above mentioned manholes and Bldg. 11002 there are no empty ducts, but there is enough spare capacity within these ducts to run new copper and fiber optic cabling from Bldg. 11002. All new buildings on the site shall be provided service from the node distribution building. Individual cables shall be provided directly to each building without going into any other building. Cabling between the distribution node building and

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all other buildings shall be direct buried outside the 5 foot building line. Work inside Bldg. 11002 shall include providing Avaya fiber high density distribution panels C.C. 700-007-214 LST1U-144/9 to terminate outgoing fiber optic cabling. Number and size of panels shall be sufficient to terminate all outgoing strands. In addition, mount new Reltec C-388 protector blocks on existing main distribution frame and terminate all outgoing copper cabling on these blocks.

34.8.10 The following work shall be accomplished to provide service to and on the 200/300 block site. Service shall be obtained from Bldg. 13. See Attachment 26E for location of Bldg. 13 and the 200/300 Blk. Existing duct shall be used for cabling between Bldg. 13 and MH100 located to the east of Bldg. 14. From MH100 provide a 4-way 4-inch concrete encased duct system (one duct with 4-1" inner ducts) parallel to the existing duct system heading north along 52nd St. and then heading east along 761st Tank Battalion Ave. to MH170 on the corner of 761st Tank Battalion and 37th St. New ducts shall be core drilled into existing manholes along the entire path. From MH170, a minimum (actual design may require more to accommodate cabling) of 2-4" concrete encased duct (one with 4-1" inner ducts) system shall be provided to a new handhole that shall be located adjacent to the communication distribution node building. The ducts shall continue from the handhole into the building and stub up adjacent to a wall. In addition, four spare 4" conduits shall be provided between the handhole and the building. They shall be stubbed up adjacent to the other two ducts inside the building. All new buildings on the site shall be provided service from this building. Individual cables shall be provided directly to each building without going into any other building. Cabling between the distribution node building and all other buildings shall be direct buried outside the 5 foot building line. Work inside Bldg. 13 shall include providing Avaya fiber high density distribution panels C.C. 700-007-214 LST1U-144/9 to terminate outgoing fiber optic cabling. Number and size of panels shall be sufficient to terminate all outgoing strands.

34.8.11 The following work shall be accomplished to provide service to sites 25, 26 , & 27 (9500 BLK). Service shall be obtained from Bldg.11002. See Attachment 27E. A new duct & manhole system shall be provided between sites and Bldg. 11002. Duct system shall be 4-way 4-inch concrete encased duct system (one duct with 4-1" inner ducts). Work in Bldg. 11002 shall be as described by service to the 800 block site as previously described.

34.8.12 The following work shall be accomplished to provide service to sites 8 (16000 BLK) & 9 (17000 BLK). Service shall be obtained from Bldg.11002. See Attachment 28E. A new duct & manhole system shall be provided between sites and Bldg. 11002. Duct system shall be 4-way 4-inch concrete encased duct system (one duct with 4-1" inner ducts). Work in Bldg. 11002 shall be as described by service to the 800 block site as previously described.

34.8.13 The following work shall be accomplished to provide service to site 30 (HAAF Area). Service shall be obtained from Bldg.7008. See Attachment 29E. A new duct & manhole system shall be provided between sites and Bldg. 7008. Duct system shall be 4-way 4-inch concrete encased duct system (one duct with 4-1" inner ducts). Work inside Bldg. 7008 shall include providing fiber high density distribution panel to terminate outgoing fiber optic cabling. Number and size of panels shall be sufficient to terminate all

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outgoing strands. In addition, mount new protector blocks on existing main distribution frame and terminate all outgoing copper cabling on these blocks.

34.8.14 Service to site 10 (1900 BLK) shall be obtained by extending a new duct system to the existing manhole shown on attachment 30E. Cable shall be spliced in the existing manhole.

34.8.15 As a result of the demolition of buildings 4476 and 4452 new fiber optic (FO) cabling work shall be accomplished. These two buildings serve as distribution nodes for other buildings on the site. All work shall be accomplished before the buildings are demolished. All work required in the following three subparagraphs shall be accomplished in a continuous time frame to minimize downtime.

34.8.15.1 Building 4476 is currently fed aurally with a 96 strand FO cable as is shown on attachment 3E. As can be seen from the attachment, the 96 strand cable is feeding (via splicing) a 60 strand aerial cable, a 36 strand aerial cable, and 2-12 strand aerial cables from inside the building. One of the 12 strand cables is feeding building 4475 which is scheduled to be demolished so this cable shall be removed with no new connectivity required. Connectivity, however, for the other three cables shall be reestablished (via splicing in a new splice case) at the nearest pole to Bldg. 4476 from which the 96 strand cable is attached to. The portion of the 96 strand cable between this pole and building 4476 shall be removed. If necessary, new cabling shall be provided to accomplish this work to avoid splices between the new splice case and the termination point inside the existing buildings. In addition, if new cabling is provided contractor shall clear all existing cabling that has been replaced from poles and shall remove it from the splice cases inside the buildings.

34.8.15.2 Building 4452 is currently fed aurally with a 168 strand FO cable as is also shown on attachment 3E. As can be seen from the attachment, the 96 strand cable is feeding (via splicing) a 72 strand aerial cable, a 24 strand aerial cable, and 2-12 strand aerial cables from inside the building. Connectivity shall be reestablished (via splicing in a new splice case) at the nearest pole to Bldg. 4452 from which the 168 strand cable is attached to. The portion of the 168 strand cable between this pole and building 4452 shall be removed. If necessary, new cabling shall be provided to accomplish this work to avoid splices between the new splice case and the termination point inside the existing buildings. In addition, if new cabling is provided contractor shall clear all existing cabling that has been replaced from poles and shall remove it from the splice cases inside the buildings.

34.8.15.3 Buildings 4465, 4466, and 4467 shown on attachment 3E are going to be demolished. These buildings are each fed with a 12 strand FO aerial cable originating in Bldg. 4449. Each cable shall be removed including removal from the splice case inside Bldg. 4449. Building 4468 is also going to be demolished. This building is fed with a 12 strand FO aerial cable originating in Bldg. 4470. Cable shall be removed including removal from the splice case inside Bldg. 4470.

34.9 A grounding grid shall be installed in parking area east of building 4616. Grid shall consist of bare buried cable and ground rods using a 30 foot square spacing.

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35. ~~(AM #0002) NOT USED STORAGE BUILDING (17000 BLOCK)~~

~~35.1 Facilities~~

~~The project will include functional space for a Storage Facility. The facility shall be permanent construction.~~

~~35.2 Design Criteria~~

~~35.2.1 Army Standard Design~~

~~There are no Army Standard Designs for this facility.~~

~~35.2.2 Rudimentary drawings~~

~~Rudimentary Drawings included in this RFP include a functional floor plan of the Storage Facility. This drawing is included for design and coordination purposes. Further development of this design will require coordination with the using agency and base personnel. Revisions and refinements to this rudimentary drawing, or any other drawings and plans developed as a result of this proposal, should be expected during the course of design development until final design is achieved.~~

~~35.2.3 Handicapped Access~~

~~The Storage Facility will not be handicapped accessible.~~

~~35.2.4 Signage~~

~~Provide exterior signage in accordance with paragraph Exterior Signage and interior signage in accordance with paragraph INTERIOR DESIGN/Signage Requirements. Provide a building number sign.~~

~~35.2.5 Fire Extinguishers~~

~~Provide fire extinguishers as required by Installation requirements or code. Fort Hood's DPW Fire Dept. no longer provides fire extinguishers.~~

~~35.3 Site Design Requirements~~

~~See site development paragraphs such as SITE DESIGN AND CONSTRUCTION, UTILITY LAYOUT AND DESIGN, STORM DRAINAGE, GAS DISTRIBUTION, and SITE GRADING.~~

~~35.4 Architectural Design Requirements~~

~~35.4.1 General~~

~~The storage facility shall be one story permanent structure on pre-engineered structural frame that meets the functional requirements specified below. Creative solutions that minimize delivery time are encouraged.~~

~~35.4.2 Functional Layout~~

~~Provide one 16,000 SF Storage Facility. Functional requirements for the facility type are described below. See diagrammatic floor plan attached to the end of this Section.~~

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~~a. **Large Storage Bays** 7 @ 2,000 SF ea. Provide a pair of 4' x 8' doors (8' opening) at the ends of each storage bay. Provide a hook mounted fire extinguisher inside each set of doors. Bays are separated with padlockable wire mesh partitions. The bottom of the roof trusses/structures are also secured with wire mesh to provide a barrier (12' minimum height). Subdivide the bays with wire mesh as per user requirements.~~

~~b. **Small Storage Bays** 2 @ 1,000 SF ea. Provide a pair of 4' x 8' doors (8' opening) for each storage bay. Provide a hook mounted fire extinguisher inside each set of doors. Bays are separated with padlockable wire mesh partitions. The bottom of the roof trusses/structures are also secured with wire mesh to provide a barrier (12' minimum height). Subdivide the bays with wire mesh as per user requirements.~~

~~Provide paved access at all entrances meeting applicable codes. See electrical requirements for communications requirements.~~

~~35.4.3 Room Sizes~~

~~Room sizes shown on the attached sketch are minimum clear space. A diagrammatic floor plan is provided at the end of this Section. Minor adjustments to room sizes may be acceptable if furnishings and functionality of the rooms are unaffected. A minimum clear space of 12 feet 0 inches is required between the floor and the bottom of the roof trusses/structure.~~

~~35.4.4 Finishes~~

~~Exterior and interior finishes shall be the manufacturer's standard commercial grade products and standard colors except where noted otherwise. Exterior and interior finishes shall conform to Fort Hood design standards. The floor finish in the Storage Facility shall be sealed concrete. Provide color/finish sample boards.~~

~~35.4.4.1 Exterior Finishes~~

~~The following exterior finishes are approved for the Storage Facility:~~

- ~~• Metal Panel Roof with fluoropolymer finish.~~
- ~~• Roof drainage system (gutters, downspouts, flashing) with same type finish.~~
- ~~• Metal Panel siding with fluoropolymer finish.~~
- ~~• Aluminum Windows & Doors with anodized finish.~~
- ~~• Steel Doors and frames with factory primed, site painted finish.~~

~~35.4.4.2 Metal Siding~~

- ~~• Use channel iron side girts for a structural steel bldg that have added sag rods. Connect one and one half zee to the channel iron by either welding or screws. Connect the siding to the zee.~~
- ~~• Install liner panels on the side walls of maintenance shops to protect the building insulation and to facilitate cleaning.~~
- ~~• The side girt spacing is critical for a metal building because the spacing determines the profile of the sidewall panel. A deeper profile will allow a wider spacing of the side girt. Consideration should be given to availability of the profile specified.~~
- ~~• Provide hidden fastener sidewall panels if possible.~~

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- ~~Provide a vapor barrier and insulation barrier around the insulated envelope of the building. Without a well constructed vapor barrier there is a tendency to create an environment for growing mold.~~

~~35.4.4.3 Doors~~

~~Exterior doors shall swing out. Exterior doors shall be insulated hollow metal. Exterior entry doors shall be SDI Level 3.~~

~~35.4.4.4 Door Hardware~~

~~All doors shall have minimum three heavy duty (grade 1) hinges per leaf. Locksets at exterior doors shall have 1 inch dead bolts. Exterior outswinging doors shall have non-removable hinge pins. Provide three Master keys that cannot be reproduced. Provide five sets of keys for each lock.~~

~~35.4.4.5 Rainwater Management~~

~~Provide gutters, downspouts and concrete splash blocks. If gutters are not feasible for this type of structure, provide a means of diverting rainwater from the roof around all personnel doors is required; provide justification.~~

~~35.4.5 Interior Design~~

~~35.4.5.1 Structural Interior Design~~

~~See paragraph STRUCTURAL INTERIOR DESIGN (SID).~~

~~35.4.5.2 Interior Chain Link Fencing~~

- ~~Make sure security fence fabric is 12 feet high. Fabric is normally 9 gauge, verify with user.~~
- ~~Do not detail a top pipe rail for the security fence.~~
- ~~Chain link fence fabric shall be secured with wire ties not clips.~~

~~35.4.5.3 Comprehensive Interior Design~~

~~See paragraph COMPREHENSIVE INTERIOR DESIGN (CID).~~

~~35.4.5.3.1 CID Furnishing List~~

~~Typical CID items to specify are, but not limited to:~~

- ~~Support desks~~
- ~~Bulletin Boards, Porcelain Marker Boards~~
- ~~Chairs all kinds, including stools~~
- ~~Files all kinds~~
- ~~Storage all kinds~~
- ~~Tables all kinds~~
- ~~Waste cans various sizes~~
- ~~Include all specific/special items as required by the Government/user.~~

~~35.5 Structural Design Requirements~~

~~See paragraph STRUCTURAL DESIGN REQUIREMENTS.~~

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~~35.6 Plumbing Design Requirements~~

~~35.6.1 General~~

~~Plumbing system shall be designed and installed in accordance with the latest edition of the International Plumbing Code and the Fort Hood Installation Design Guide. The Contractor shall be responsible for finish installation of fixtures and piping systems. Gas lines and fixtures shall be installed in accordance with the latest edition of the NFPA 54 National Fuel Gas Code. Use Unified Facilities Guide Specifications.~~

~~35.6.2 Wall Hydrants (Exterior)~~

~~Wall hydrants shall be provided at a maximum spacing interval of 200 feet around the exterior wall of the building, with a minimum of two hydrants for each building, one on each opposing wall. Each hydrant shall be box type, freeze proof, with an integral vacuum breaker/backflow preventer. Hydrants shall have 3/4 inch hose connections. The piping supplying the wall hydrants shall be drainable.~~

~~35.7 Heating And Ventilating Requirements~~

~~35.7.1 Mechanical Requirements~~

~~The mechanical systems will be designed in accordance with the Request for Proposal issued by the Fort Worth Corps of Engineers, ASHRAE standards, International Mechanical code, NFPA Standards and the International Standard Plumbing Code. The Unified Facilities Guide Specifications will be used.~~

~~The mechanical system shall comply with the following design criteria and standards:~~

- ~~• ASHRAE Standard 90.1-2001, Energy Standard for Buildings, Except Low-Rise Residential Buildings~~
- ~~• International Mechanical Code.~~
- ~~• ASHRAE Manuals, latest edition.~~
- ~~• NFPA 90A, Installation of Air Conditioning and Ventilating Systems.~~
- ~~• NFPA 90B, Installation of Warm Air Heating and Air Conditioning Systems.~~
- ~~• ASHRAE Standard 62-2001, Ventilation for Acceptable Indoor Air Quality.~~
- ~~• SMACNA HVAC Duct Construction Standards, latest editions.~~
- ~~• NFPA 54, National Fuel Gas Code.~~
- ~~• Fort Hood Installation Design Guide.~~

~~35.7.2 Heating and Ventilation~~

~~The HVAC system shall be energy efficient and provide heating and forced ventilation only. The heating of the building will be accomplished by means of gas fired vented infrared heaters.~~

~~35.7.3 Ventilation Systems Design~~

~~Ventilation for building occupants shall be provided in accordance with ASHRAE Standard 62-2001.~~

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~~35.7.4 Design Parameters~~

~~35.7.4.1 Outdoor Design Temperatures shall be 25 degrees F dry bulb winter design for Fort Hood.~~

~~35.7.4.2 Storage area will be heated to 40 degrees F for freeze protection. Indoor summer design temperature shall be 10 degrees F above the outdoor design temperature. Include capacity allowance for fresh air quantities in accordance with ASHRAE 62-2001 Ventilation Standards.~~

~~35.7.5 Heating And Ventilating Equipment~~

~~The equipment described below is a minimum. All materials and equipment provided shall be standard catalogued products of manufacturers regularly engaged in the production of such materials and equipment and shall be of the manufacturers' latest standard design. Equipment shall comply with the requirements of Underwriter's Laboratories, Inc. (UL), Air Conditioning Refrigeration Institute (ARI), American Society for Testing and Materials (ASTM), National Electric Manufacturer's Association (NEMA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA), or other national trade associations as applicable.~~

~~All suspended equipment shall be properly supported according to the manufacturer's instructions. Provide trapeze hangers for larger pieces of equipment. Provide adequate clearance around all pieces of equipment for periodic maintenance, inspection and cleaning. Service of one piece shall not require disturbance of adjacent equipment.~~

~~Each piece of motorized equipment shall be provided with vibration isolators per latest edition ASHRAE Fundamentals Handbook. Nominal deflection and natural frequency of isolation equipment shall be selected based upon equipment size and structural attachment details.~~

~~Mechanical components shall be installed and mounted in accordance with seismic guidelines per latest edition of ASHRAE Applications Handbook.~~

~~35.7.6 Fans~~

~~Provide exhaust fans and motorized louvers sufficient to meet ASHRAE Standard 62-2001.~~

~~35.7.7 System Maintainability~~

~~Ensure that all equipment is easily accessible for servicing and cleaning.~~

~~35.7.8 Piping and Accessories~~

~~Piping, valves, fittings, and accessories shall be in accordance with NFPA 54.~~

~~35.7.9 Controls~~

~~For HVAC systems or equipment that does not come with integral packaged controls, Direct Digital Controls (DDC) shall be used. The thermostats shall be digital with an off-on switch. The heating temperatures will be fixed non adjustable.~~

~~35.8 Fire Protection~~

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~~35.8.1 Design Standards and Codes~~

~~The fire protection design for all facilities shall be in accordance with the following:~~

~~INTERNATIONAL CODE COUNCIL, INC
5203 Leesburg Pike, Suite 708
Falls Church, VA 22041-3401~~

~~IBC, 2003, International Building Code~~

~~NATIONAL FIRE PROTECTION ASSOCIATION
One Batterymarch Park
Quincy, MA 02269-9101~~

~~National Fire Codes (NFC) Current as of 2004~~

~~UNIFIED FACILITIES CRITERIA~~

~~UFC 3-600-01, 2003, Design: Fire Protection Engineering for Facilities
UFGS Guide Specifications~~

~~35.8.2 Qualifications of Fire Protection Engineer~~

~~The design of the fire protection features shall be by a qualified fire protection engineer meeting one of the following conditions: a.) An engineer with a Bachelor of Science or Masters of Science Degree in fire protection engineering from an accredited university engineering program, plus a minimum of 5 years' work experience in fire protection engineering. B.) A registered professional engineer who has passed the National Council of Examiners for Engineering and Surveys (NCEE) fire protection engineering written examination. C.) A registered P.E. in a related engineering discipline with a minimum of 5 years' experience dedicated to fire protection engineering. The name and credentials (education, registration, experience) of the fire protection engineer shall be submitted.~~

~~35.8.3 Fire Protection and Life Safety Analysis~~

~~A fire protection and life safety design analysis shall be provided for all buildings in the project. The analysis shall include classification of occupancy (both per the IBC and NFPA 101); type of construction; height and area limitations (include calculations for allowable area increases); life safety provisions (exit travel distances, common path distances, dead end distances, exit unit width required and provided); building separation or exposure protection; specific compliance with NFPA codes and the IBC; requirements for fire rated walls, doors, fire dampers, etc.; analysis of automatic suppression systems and protected areas; water supplies; smoke control systems; fire alarm system, including connection to the base wide system; fire detection system; standpipe systems; fire extinguishers; interior finish ratings; and other pertinent fire protection data. The analysis shall include a life safety floor plan for all buildings in the project showing occupant loading, occupancy classifications and construction type, egress travel distances, exit capacities, sprinklered areas, fire extinguisher locations, ratings of fire resistive assemblies, and other data necessary to exhibit compliance with life safety code requirements.~~

~~35.8.4 Fire Flow Data. Refer to Civil Design for design requirements.~~

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~~35.8.5 Sprinkler System~~

~~35.8.5.1 General~~

~~Automatic sprinkler protection shall be provided for buildings as follows:~~

~~Supply/Storage Facility. Provide sprinkler protection per the requirements of UFC 3-600-01. Per UFC 3-600-01, 4-2.2, sprinkler protection is required for facilities that contain equipment or materials that are considered to be mission essential (for example TA 50 equipment). Per UFC 3-600-01, 6-10.1 storage facilities must have complete automatic sprinkler protection. Sprinkler protection must be based on Class IV commodities as defined by NFPA 13.~~

~~35.8.5.2 Design Requirements~~

~~Where sprinkler protection is required the facilities shall be fully protected with automatic wet pipe sprinkler systems. Dry pipe systems shall be provided if freeze protection is required. All floors and all areas of the facilities shall be protected. The sprinkler system design shall be in accordance with UFC 3-600-01, NFPA 13, and NFPA 13R where applicable. The sprinkler hazard classifications shall be in accordance with UFC 3-600-01 appendix B and NFPA 13. Design densities, design areas and exterior hose streams shall be in accordance with UFC 3-600-01 table 4-1. The sprinkler systems shall be designed and all piping sized with computer generated hydraulic calculations. The exterior hose stream demand shall be included in the hydraulic calculations. A complete sprinkler system design, including sprinklers, branch lines, floor mains and risers, shall be shown on the drawings. The sprinkler system plans shall include node and pipe identification used in the hydraulic calculations. All sprinkler system drains, including main drains, test drains, and auxiliary drains, shall be routed to a 2' x 2' splash block at exterior grade.~~

~~35.8.5.3 Sprinkler System~~

~~The sprinkler service main shall be a dedicated line. Sprinkler service and domestic service shall not be combined. The sprinkler service main shall be provided with an exterior post indicator valve with tamper switch reporting to the fire alarm control panel (FACP). The service main shall extend from the water distribution system to the building and shall be dedicated for fire protection. The sprinkler entry riser shall include a double check backflow preventer, a fire department connection, and a wall hydrant for testing of backflow preventer. The sprinkler system shall include an indicating control valve, an alarm check valve or dry pipe valve, a water motor alarm and a flow switch reporting to the FACP. All control valves shall be OS&Y gate type and shall be provided with tamper switches connected to the FACP. Facilities with multiple floors shall be provided with floor control valves for each floor. The floor control valve assembly shall be in accordance with NFPA 13, Figure A-5-15.4.2 (b). Clearances for piping passing through floor slabs shall be provided by pipe sleeves with dimensions per NFPA 13, 9.3.4.3. Clearance for all other penetrations shall be per NFPA 13, 9.3.4.~~

~~35.8.5.4 Sprinklers. Sprinklers located in finished areas shall be recessed pendant type.~~

~~35.8.5.5 Exterior Hose Stream. Exterior hose stream demand shall be in accordance with UFC 3-600-01. This shall be 250 gpm for light hazard and 500~~

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~~gpm for ordinary hazard. Exterior hose stream demand shall be included in the sprinkler system hydraulic calculations.~~

~~35.8.5.6 Backflow Preventer. A double check backflow preventer shall be provided on the fire water main serving each building. This shall be located within the building. An exterior wall hydrant with OS&Y valve shall be provided to allow testing of backflow preventer at design flow as required by NFPA 13.~~

~~35.8.5.7 Fire Department Connection. A fire department connection shall be provided for each building with sprinkler protection. These shall be located to be directly accessible to the fire department.~~

~~35.8.6 Fire Pump. If required a complete fire pump installation shall be provided. Fire pump installation shall be in accordance with UFC 3-600-01, NFPA 13, NFPA 20, and UFGS 13920.~~

~~35.8.7 System Components and Hardware. Materials for the sprinkler system and fire pump system (if required) shall be in accordance with NFPA 13, NFPA 20, and NFPA 24. Sprinkler and standpipe system piping shall be black steel and shall be minimum Schedule 40 for sizes 2 inches and less and minimum Schedule 10 for sizes greater than 2 inches.~~

~~35.8.8 Fire Hydrants. Refer to Civil Design for design requirements.~~

~~35.8.8.1 Fire Extinguishers and Cabinets. Refer to Architectural Design for design requirements.~~

~~35.8.9 Fire Alarm and Detection System. Refer to Electrical Design for design requirements.~~

~~35.8.10 Electrical Design Requirements~~

~~See paragraphs INTERIOR ELECTRICAL DESIGN and SITE ELECTRICAL SYSTEMS.~~

36. **(AM #0002) NOT USED** ~~CLASSROOM BUILDING (16000 BLOCK)~~

~~36.1 FacilitiesThe project will include functional space for a Classroom Facility. The facility shall be permanent construction.~~

~~36.2 Army Standard Design~~

~~—There are no Army Standard Designs for this facility.~~

~~36.3 Design Criteria~~

~~36.3.1 Rudimentary drawings~~

~~Rudimentary drawings included in this RFP include a functional floor plan of the Classroom Facility; it is attached to the end of this Section. This drawing is included for design and coordination purposes. Further development of this design will require coordination with the using agency and base personnel. Revisions and refinements to this rudimentary drawing, or any other drawings and plans developed as a result of this proposal, should be expected during the course of design development until final design is achieved.~~

~~36.3.2 Handicapped Access~~

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~~The Classroom Facility shall be handicapped accessible. Ramps and sidewalks shall be provided for handicapped access to the Classroom Facility. The number of parking spaces and site access for the physically disabled shall be two spaces per facility. One parking space shall be van accessible.~~

~~36.3.3 Signage~~

~~Provide exterior signage in accordance with paragraph Exterior Signage and interior signage in accordance with paragraph INTERIOR DESIGN/Signage Requirements. Provide a building number sign.~~

~~36.3.4 Fire Extinguishers~~

~~Provide fire extinguishers as required by Installation requirements or code. Fort Hood's DPW Fire Dept. no longer provides fire extinguishers.~~

~~36.3.5 Slabs on Grade~~

~~All interior slabs on grade, including storage rooms, shall be underlain by a moisture vapor barrier consisting of lapped polyethylene sheeting having a minimum thickness of 6 mils and a minimum ~~AM-0002~~ 4 6 inches thick capillary water barrier of open graded, washed pea gravel, or crushed stone. Concrete slabs shall be jointed around columns and along supported walls to minimize cracking due to possible differential movement.~~

~~36.4 Site Design Requirements~~

~~See site development paragraphs such as SITE DESIGN AND CONSTRUCTION, UTILITY LAYOUT AND DESIGN, STORM DRAINAGE, WATER DISTRIBUTION (OPTION 1), SANITARY SEWER (OPTION 1), GAS DISTRIBUTION, and SITE GRADING.~~

~~36.5 Architectural Design Requirements~~

~~36.5.1 General~~

~~The facility shall be a one-story permanent building on pre-engineered structural frame that meet the functional requirements specified below. Creative solutions that minimize delivery time are encouraged.~~

~~36.5.2 Functional Layout~~

~~Provide one 4,500 SF Classroom Facility. Functional requirements for this facility type are:~~

- ~~• **Vestibule** 50 SF. Provide resilient flooring.~~
- ~~• **Lobby** 125 SF. Provide one fire extinguisher in a flush mounted wall cabinet. Provide resilient flooring.~~
- ~~• **Training Storage Area** 300 SF. Provide resilient flooring. Storage for 140 extra folding chairs.~~
- ~~• **Classrooms** 2 @ 1500 SF ea. 100 students ea. Provide student chairs with cushions and folding writing surfaces. Provide Dry-Erase whiteboards and a manual projector screen. Provide a folding partition between the classrooms so they may be converted into one large classroom. Provide two fire extinguishers in flush mounted wall cabinets (one by each exit door). Provide carpet tile flooring.~~
- ~~• **Restrooms** 2 @ 200 SF ea. Provide ADA compliant restrooms for males and females. Male restrooms shall include 2 lavatories, 2 urinals, and 2~~

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~~toilets. Female restrooms shall include 3 lavatories, and three toilets. Provide ceramic tile flooring with drains in each restroom.~~

- ~~• **Janitor's Closet** 15 SF. Constructed from noncombustible materials, and positive latching on door. Provide ceramic tile flooring with floor drain.~~
- ~~• **Communications Closet** 80 SF. Secure communications closet for equipment and panelboard. Conditioned space with cipher lock at door. See electrical requirements. Provide sealed concrete slab.~~
- ~~• **Electrical Room** 100 SF. Constructed from noncombustible materials, one hour fire rating in walls, and door to exterior. Provide sealed concrete slab.~~
- ~~• **Mechanical Room** 200 SF. Constructed from noncombustible materials, one hour fire rating in walls, and door to exterior. Provide sealed concrete slab with floor drain.~~

~~These requirements are the minimum. Areas indicated are net square feet, and may be exceeded.~~

~~Arrange spaces in an efficient manner with simple circulation.~~

~~All facilities shall include stairs or ramps and entry landings at all entrances to meet applicable codes. All janitor closets shall have mop sink, mop rack, 6 lf of storage shelving and floor space for storage of janitorial equipment. Except where noted otherwise, all facilities shall have mechanical and electrical spaces to accommodate required equipment with space for maintenance/repair access without having to remove other equipment. See electrical requirements for communications room/SIPRNET communication room requirements.~~

~~36.5.3 Room Sizes~~

~~Room sizes shown above are minimum clear space. A diagrammatic floor plan is provided at the end of this Section. Minor adjustments to room sizes and arrangements may be acceptable if furnishings and functionality of the rooms are unaffected. Ceilings at occupied areas shall be a minimum 8 feet 0 inches. Ceilings in classrooms shall be a minimum of 10 feet 0 inches.~~

~~36.5.4 Finishes~~

~~Exterior and interior finishes shall be the manufacturer's standard commercial grade products and standard colors except where noted otherwise. Exterior and interior finishes shall conform to Fort Hood design standards. The floor finish in all restrooms, janitor closets, and all other wet areas shall be ceramic tile. Suspended acoustic tile ceiling is not permitted for restrooms, janitor closets, communications rooms, and mechanical and electrical rooms. Provide color/finish sample boards.~~

~~36.5.4.1 Exterior Finishes~~

~~The following exterior finishes are approved for the Classroom Facility:~~

- ~~• Standing Seam Metal roof with fluoropolymer finish.~~
- ~~• Roof Drainage System (gutters, downspouts, flashing) with same type finish.~~
- ~~• Masonry Veneer designed in the context of nearby facilities/structures.~~
- ~~• Aluminum Windows & Doors with anodized finish.~~
- ~~• Steel Doors and frames with factory primed, site painted finish.~~

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~~36.5.4.2 — Masonry~~

- ~~• Where cavity wall CMU/brick construction is used, provide for damp proofing outside of the CMU.~~
- ~~• Provide masonry walls around mechanical rooms for sound insulation and fire protection.~~
- ~~• Provide masonry screen walls around mechanical yards for appearance and security. The screen wall shall be provided with a lockable gate.~~
- ~~• Provide a vapor barrier and insulation barrier around the insulated envelope of the building. Without a well constructed vapor barrier there is a tendency to create an environment for growing mold.~~

~~36.5.4.3 — Standing Seam Metal Roof System~~

- ~~• Provide metal deck over roof structure with 3 1/2 inch or 4 1/2 inch zee purlins screw attached through the metal deck to the roof structure. The standing seam roof will be attached to the zee purlins. Rigid building insulation will be inserted below the zee purlins and is sandwiched between the metal deck and the standing seam metal roof (on large OMA or MCA projects). This system provides a firm surface for the DPW maintenance workers to walk on periodically. If frequent visits to the roof are anticipated, grated walkways may be attached directly to the standing seams with no roof penetrations. This system protects the building insulation from damage and from the effects of gravity/creep that has the tendency to pull exposed insulation down over a period of years.~~
- ~~• Provide minimum roof slopes of 2 on 12 rather than the historical 1 on 12. Experience shows that most roofs with a 1 on 12 roof slope ultimately have one or more flat spots created by construction tolerances, steel fabrication errors, and some installation problems. Low sloped roofs depend upon caulk to prevent leakage. For a 1 on 12 sloped roof, water will back uphill 12 inches for every 1 inch depth of water. Therefore, any overlap, roof penetration and exposed fastener is immersed in water.~~
- ~~• Provide full length standing seam roof sheets. We have had contractors ship panels up to 55 feet in length by truck to Fort Hood. We have had at least one contractor roll 150 feet long standing seam roof sheets on site. The one piece roof sheets eliminate all end laps, thus reducing the potential roof leaks.~~

~~36.5.5 — Doors And Windows~~

~~Windows will utilize 1 inch insulated units with 1/4 inch exterior laminated glass and 1/4 inch laminated interior glass. All exterior glazing shall be 3/4 inch laminated glass consisting of two 1/8" thick glass panes bonded together with a minimum 0.030 inch thick PVB interlayer. For insulating glass units, the inner pane shall be laminated glass as described above. Glazed door and window frames shall resist an equivalent static design load of 1 lb per square inch applied to surface of glazing and frame with frame deformation not exceeding 1/60 of the unsupported member lengths. Steel members may be designed using ultimate yield stresses and aluminum members may be designed based on a 0.2 percent offset yield strength. Glazing shall have a minimum frame bite of 1 inch. Door/window frame connections to building, hardware and~~

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~~associated connections and glazing stop connections shall resist equivalent static design load of 10.8 psi for glazing panels with vision area less than or equal to 10.8 square feet and 4.4 psi for glazing panels with vision area greater than 10.8 square feet and less than 32 square feet. Loads shall be applied to the surface of the glazing and the frame. Connections and hardware may be designed based on ultimate strength for steel and 0.2 percent offset yield strength for aluminum. All exterior doors must swing out. Exterior doors shall be insulated hollow metal. Exterior entry doors shall be SDI Level 3. Windows shall be energy efficient with double pane insulating glass units. Operable windows at administrative offices are preferred. All windows shall have mini blinds. All operable windows shall have insect screens and locks.~~

~~36.5.6 Door Hardware~~

~~All doors shall have minimum three heavy duty hinges per leaf. Locksets at exterior doors shall have deadlock feature. Exterior outswinging doors shall have non-removable hinge pins. Provide three Master keys that cannot be reproduced. Provide five sets of keys for each lock.~~

~~36.5.7 Sound Isolation~~

~~Partitions at classrooms shall have STC 49 for sound isolation from all adjacent rooms.~~

~~36.5.8 Building Numbers~~

~~Facility shall have a building number sign located on two faces, permanently affixed to building. Location, design, size and colors shall be in accordance with Fort Hood Installation Design Guide. Coordinate with Fort Hood, through the Contracting Officer, for assigned building numbers for each facility.~~

~~36.5.9 Rainwater Management~~

~~Provide gutters, downspouts and concrete splash blocks. If gutters are not feasible for the type of structure provided, provide a means of diverting rainwater from the roof around all personnel doors is required; provide justification.~~

~~36.5.10 Interior Design~~

~~Furnish SID and CID submittals in accordance with paragraph STRUCTURAL INTERIOR DESIGN (SID) and COMPREHENSIVE INTERIOR DESIGN (CID). The preparation of the Comprehensive Interior Design is part of the bid item.~~

~~36.5.10.1. Signage Requirements~~

~~Interior signage is an important item that is to be fully integrated with the architecture and building related finishes. All signage shall be in accordance with the Department of the Army Technical manual, Signage, TM 5-807-10 and installation sign standards (See the Fort Hood Installation Design Guide). All signs are to be from one manufacturer and shall match in color and style. All room sign copy is to be Helvetica medium with a ratio of height and width to meet Americans with Disabilities Act (ADA) requirements. Signs are to be provided for all interior doors. Installation shall be wall mounted, on the latch side of the door with the center of the sign installed 5 feet 0 inch above the finish floor and 3 inches from the outside edge of the metal door frame. Where conditions do not allow signs to be mounted directly~~

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~~adjacent to the door, install signs on the wall at the nearest point to the latch side. All signs are to have a permanent room number sign. All signs are to be a minimum overall dimension of 9 inches wide and 6 inches high. Under the visual printed room number an integral, tactile, corresponding, Grade 2 Braille indicating the room number. The second two slides are to be window insert slides to accommodate personnel changes or room name changes. Inserts shall allow the user to insert computer generated copy behind acrylic face insert. BB5 sign types shall be 6 inches wide by 8 inches high. Mechanical rooms and other building system room and service support rooms (BB4) including restrooms (BB7) are to have permanent room signs with copy that has raised room numbers and permanent room names. Copy is to be raised, tactile, letters and Grade 2 Braille indicating the room number and room name. All signs are to be permanently and mechanically attached to the building. Double sided tape will not be accepted. Signage message shall be coordinated with the Contracting Officer before ordering or installation. Provide Emergency Egress sign plaques (BB8) that indicate "YOU ARE HERE" and the path of egress. These signs are to be fully coordinated with the installation Fire Marshall at the review submittal design phase and before fabrication and installation. The Fire Marshall is to review the correct placement and quantity of these signs within the building and also review the proposed path of egress that will be graphically illustrated on the sign. Suggested placements for these signs are to be determined before installation.~~

~~36.5.10.2 Acoustical Ceilings~~

~~Provide ceiling tiles that are rated for use in high humidity conditions, referred to as an RH90 ceiling tile. Ceiling tile is to be attractive and look as normal as any cellulose backed ceiling tile but shall have a mineral fiber backing. This is to provide non-hygroscopic materials in the facility to minimize the possibility of moisture retention and mildew.~~

~~36.5.10.3 Toilet Accessories~~

~~Toilet accessories for Fort Hood Projects shall use the following items for consistency to their Cleaning Service Contract:~~

- ~~• Toilet Tissue Dispenser: Georgia-Pacific model # 56T, Eclipse Quickview, 9" twin Jumbo, bath Tissue Dispenser, Color: Smoke.~~
- ~~• Paper Towel Dispenser: Georgia-Pacific Model # 84T, Eclipse Quickview, Lever control, Roll Towel Dispenser, Color: Smoke.~~

~~36.5.10.4 Comprehensive Interior Design~~

~~36.5.10.4.1 CID Furnishing List~~

~~Typical CID items to specify are, but not limited to:~~

- ~~— Bookcases & Display Cases~~
- ~~— Bulletin Board, Porcelain Marker Boards~~
- ~~— Chairs all kinds, including stools~~
- ~~— Desks freestanding technical~~
- ~~— Files all kinds~~
- ~~— Podium/lecture stands~~
- ~~— Storage all kinds~~
- ~~— Tables all kinds~~
- ~~— Waste cans various sizes~~
- ~~— Classroom chairs and tables~~

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~~--- Include all specific/special items as required by the Government/user. ---~~

~~36.6 Structural Design Requirements~~

~~See paragraph STRUCTURAL DESIGN REQUIREMENTS.~~

~~36.7 Plumbing Design Requirements~~

~~See paragraph PLUMBING DESIGN REQUIREMENTS.~~

~~36.8 Heating, Ventilating, And Air Conditioning Requirements~~

~~See paragraph HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS.~~

~~36.9 Fire Protection~~

~~See paragraph FIRE PROTECTION.~~

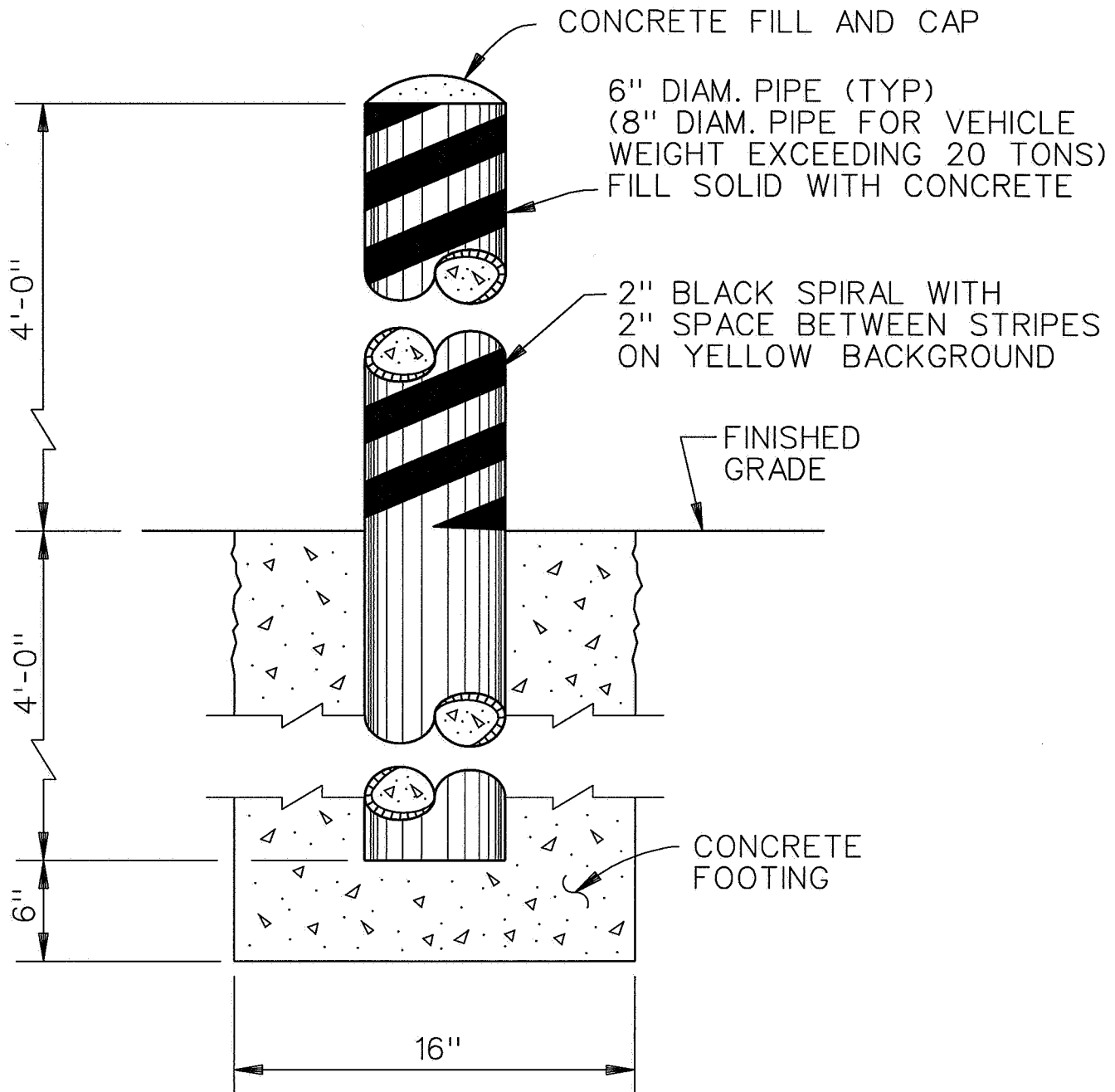
~~36.10 Electrical Design Requirements~~

~~See paragraph INTERIOR ELECTRICAL DESIGN and SITE ELECTRICAL SYSTEMS.~~

37. READY FOR OCCUPANCY

The Contractor shall develop a checklist similar to Appendix SAMPLE OF A READY FOR OCCUPANCY CHECKLIST to check each building and ensure it is ready for occupancy. Each building shall be checked with a Contracting Officer's Representative.

---End of Section---



PIPE GUARD DETAIL

N.T.S.

NOTES TO DESIGNER:

PAINTING REQUIREMENTS, INCLUDING
COLOR AND STRIPING, SHOULD BE
COORDINATED WITH USER.

SECTION 01016

DESIGN DOCUMENT REQUIREMENTS

05/2004

AMENDMENT NO. 0002

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI SP-66 (1994) ACI Detailing Manual

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1 (2000) Structural Welding Code - Steel

INTERNATIONAL CODE COUNCIL (ICC)

ICC Bldg Code (2000) ICC International Building Code

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO)

ICBO Bldg Code (1997) Uniform Building Code (3 Vol.)

MILITARY HANDBOOKS (MIL HDBK)

MIL-HDBK-1191 (July 2002) DOD Medical Military
Facilities Design and Construction Criteria

UNIFIED FACILITIES CRITERIA (UFC)

UFC 3-600-01 (17 April 2003) Design: Fire Protection
Engineering For Facilities

US ARMY CORPS OF ENGINEERS, SOUTHWESTERN DIVISION (SWD)

SWD-AEIM (October, 2000) Architectural and
Engineering Instructions Manual (SWD-AEIM)

1.2 RELATED SECTIONS

01010 GENERAL PROJECT DESCRIPTION AND DESIGN REQUIREMENTS
01012 DESIGN AFTER AWARD

1.3 SUBMITTALS

SD-05 Design Data

Design Data Checklists; .

Include the Fire Protection, Code Analysis, and Handicapped Checklists (Attachments A, B, and C) at the end of this Section with the Design Analysis and submit with the design submittals.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 DRAWINGS

Prepare, organize, and present drawings in the format specified. Provide drawings complete, accurate, and explicit enough to show compliance with the Contract requirements and to permit construction. The layout of individual sheets and the organization of the assembled set shall follow and communicate a logical sequence. General information shall be presented first, progressing to more detailed information. When assembling details, begin in the upper left-hand corner of the sheet with letters progressing to the right and down. Drawings illustrating systems proposed to meet the requirements of the Contract performance specifications shall reflect proper detailing for each such system to assure appropriate use, proper fit, compatibility of components, and coordination with the design analysis and specifications required by this section. Coordinate drawings to ensure there are no conflicts between design disciplines and between drawings and specifications. For specific drawing requirements, see paragraphs: DESIGN DEVELOPMENT REQUIREMENTS, CONSTRUCTION DOCUMENT (COMPLIANCE CHECK (FINAL 100 PERCENT DESIGN)) DESIGN REQUIREMENTS, and DESIGN DETAILS.

The following subparagraphs cover general drawing requirements and supplement those specified in SWD-AEIM, Chapter VIII DRAWINGS.

3.1.1 CADD Drawings

The Contractor shall ensure that all delivered CADD digital files and data (e.g., base files, reference files, cell/block libraries) are compatible with the Government's target CADD system and operating system, which is Bentley Systems MicroStation, version 7J, running on Microsoft Windows 95/NT/2000, and adhere to the standards and requirements specified. The term "compatible" means that data is in native digital format i.e. .dgn, and can be accessed directly by the target CADD system without translation, preprocessing, or postprocessing of the digital data files. It is the responsibility of the Contractor to ensure this level of compatibility.

3.1.2 CADD Standards

CADD drawings shall be prepared in accordance with the applicable general and discipline-specific provisions for drawing formats, level/layer assignments, line colors, line weights, and line types of the "Tri-Service A/E/C Standards" and the "SWD Architectural and Engineering Instruction Manual (AEIM), Chapter VIII, "Drafting Standards."

The CADD standards for design of this project, including seed/prototype files containing the Government's preset standard settings and electronic reference files containing the Government's standard border/title block sheets, are located at the following Web site:

<http://tsc.wes.army.mil/products/standards/aec/aecstdweb.asp>.

The Contractor shall submit a written request for approval of any deviations from the Government's established CADD standards. No deviations

will be permitted unless prior written approval of such deviation has been received from the Government.

3.1.3 Size of CADD Drawings

Overall Size of CADD drawings shall be 23.4 by 33.1 inches)), at the trim line. Full size drawings shall be submitted for all design submittals. English working units and the District's standard file-naming convention shall be used. **(AM#2) The Fort Worth District CADD File Naming convention can be found at the following web page:**

http://www.swf.usace.army.mil/pubdata/ed/mech/CADD_File_Name.asp

3.1.4 .CAL Files

In addition to copying the electronic CADD drawing files to the Submittals' CD-ROM disk, include the drawings in .cal format so that the drawings may be viewed on screen using MaxView Reader that is located on the Solicitation and Contract CD-ROM disks. Include a "sendable" compiled Project.svd index file, created with MaxView Author, so that the drawings may be viewed by double-clicking on this file. MaxView's web site is <http://www.maxview.com>. Keep the CADD files and the .cal files in separate folders.

3.1.5 Drawing Format

Title block shall include, as a minimum, project title and location, sheet title, and sequence number. For each design submittal, each Contractor-prepared drawing shall bear the printed name and signature of the registered architect or appropriate registered engineer responsible for the work portrayed on that drawing and proposed to meet the Contract requirements. For the final submittal, each Contractor-prepared drawing shall bear the stamp or seal and signature of the registered architect or appropriate registered engineer responsible for the work portrayed on that drawing and proposed to meet the Contract requirements.

3.1.6 Drawings Sequence

Arrange drawings by design discipline in accordance with the SWD-AEIM, Chapter VIII, Appendix A, Plate D1, Standard Arrangement Of Drawings.

3.1.7 Drawings Required

As a minimum, the construction drawings shall consist of the following:

- a. Cover or Title Sheet
- b. Index of Drawings (each technical discipline shall have a separate drawing legend sheet located in front of each respective section), Legend, and Abbreviations
- c. Civil/Site Drawings, including Utility Drawings (Water Supply, Wastewater, Gas, Electrical, Fiber and Communication)
- d. Soil Boring Locations and Logs of Borings
- e. Turfing and Landscaping Drawings, including Irrigation Layout Drawings
- f. Architectural Drawings

- e. Interior Design Drawings
- f. Not Used
- g. Structural Drawings
- h. Mechanical Drawings
- i. Fire Protection Drawings
- j. Electrical Drawings (including communications, security and fire alarm)
- k. Lightning Protection

l. Environmental Drawings shall include Storm Water Pollution Prevention (SWPP) or Erosion and Sediment Control (ESC) Plans. These drawings shall be prepared with the final grading plans and shall be in accordance with requirements stated in Section 01421 BASIC STORM WATER POLLUTION PREVENTION PLAN. The set of SWP or ESC drawings shall include detail sheets that depict DETAILS of applicable construction erosion and sediment control structures for the proposed site.

m. Regulated Material Survey and Abatement Design drawings for the building demolition structures

n. Schedules - e.g. Doors, Windows, Interior Finishes, Equipment

3.1.8 Drawing Scales

Work shall be drawn at the scales listed below. All disciplines should use the same scale for plan sheets. Scale for all drawings and delineation will permit complete legibility. A graphic bar or checkerboard scale will be provided on each sheet near the lower left hand corner of the sheet. Unless specified elsewhere, conventional scale standards are as follows:

<u>ENGLISH)</u>	
Site Plans (Buildings)	No smaller than 1-inch = 30 feet
Floor Plans (Note 1)	1/8-inch to 1/4-inch = 1 foot
Roof Plans	1/8-inch = 1 foot
Exterior Elevations	1/8-inch = 1 foot
Interior Elevations	1/4-inch
Cross Sections	1/4-inch to 1/8-inch
Wall Sections (Note 3)	3/4-inch = 1 foot
Stair Details	3/4-inch = 1 foot
Details (Note 2)	1 1/2 inches or 3 inches = 1 foot
Reflected Ceiling Plans	1/8-inch = 1 foot
Interior Toilet Elevations	3/4-inch to 1/2-inch
Wall Types	1 1/2 inches or 3 inches = 1 foot

Notes:

1. Scale of composite plans shall be as required so that the entire facility is drawn on one sheet without break lines.

2. The details shall be large enough to show all fixtures,

accessories, equipment, materials, manner of construction, clearances required for proper maintenance, and complete dimensions. Toilet rooms and Equipment rooms are examples of the kind of spaces which shall be drawn as a Detail Plan. All details containing sheet metal flashing shall be 3 inches = 1 foot.

3. May be 3/4-inch = 1 foot if pertinent details are shown at larger scale.

3.1.9 North Arrows

North arrows shall be oriented the same direction on all plan sheets and by all disciplines, including site and civil drawings. Plan north shall be "up" or to the left on the drawings. Indicate true north on composite plan drawings.

3.1.10 Legends and Symbols

Standard material symbols used on the drawings shall be provided as a separate legend drawing located just in front of the drawings in the set. Add additional material symbols to the Legend Sheet as needed for the project.

The standard symbols used for amendments (a triangular box) or contract modifications (a type of circular box, see the chapter on Drafting Criteria) shall not be used for any other purpose, and care must be taken to avoid using similar appearing but technically different symbols.

3.1.11 Key Plans

Provide key plans whenever the site or floor plan occupies more than one sheet of drawings. Locate the Key Plans at a uniform location on all site and floor and roof plan sheets to show the interrelationship between the building portions. Orient key plans in the same direction as the floor plan on all plan type drawings of all disciplines. All key plans shall be the same size and same location on the drawings.

3.1.12 Building Composite Plans

When required because of size of the building footprint, provide composite floor plans for the architectural, structural, mechanical, fire protection, life safety, and electrical disciplines. Include match lines for combining individual portions of floor plans. For mechanical plans, provide composite plumbing and heating, air conditioning, and ventilation (HVAC) plans showing plumbing and HVAC systems for each level. For plumbing composite sheets, building outline and pertinent HVAC equipment shall be half-toned with plumbing system at standard lineweight. For HVAC composite sheets, building outline and pertinent plumbing equipment shall be half-toned with HVAC equipment at standard lineweight. Do not provide construction notes on these plans. Include a key plan and room schedule legend on the composite plan sheets.

3.1.13 Schedules

Schedules shall be clear and complete. Furnish as many columns as necessary to present the essential information. Do not use the "Remarks" column as a substitute for an information column. Normally a single item shall be presented on each schedule line. Other scheduling methods as standard with the Architect-Engineer may be used if approved by written

authorization from the Contracting Officer.

3.1.14 Notes

Notes may be placed on drawings to reduce the amount of repetitive drafting, provided that clarity is not lost. General notes should be placed at the right-hand edge of the sheet and, if possible, should be located on the first sheet in the set. Notes that pertain to each drawing should be placed on each drawing. Keyed notes are permitted. General notes may be provided on a separate sheet if space does not exist on the Abbreviation and Legend sheets.

3.1.15 Dimensions

Dimensions shall be complete, accurate, and fully coordinated. Use slashes, not arrowheads or dots. Dimensions should be to points easily measurable in the construction, and shall be laid so as not to eliminate refiguring in the field. Dimensions should be tied-in to column lines, etc., to facilitate checking. Plan dimensions for frame construction should be to face of stud (or sheathing) for exterior walls, to one face of stud for interior partitions, and to centerline of openings. For masonry construction, dimensions shall be to one or both nominal faces of masonry and to jambs of openings.

a. Horizontal dimensions shall occur on the plans and vertical dimensions on sections and elevations.

3.1.16 Standard Drawings

Standard Drawings, when furnished for site adaptation, will generally be utilized without basic architectural change. Portions of the drawings not pertinent to the project will be deleted. Specific instructions will be given when design changes are required.

3.1.17 Sketches

All sketches presented during the design phase shall be reduced to 8-1/2" by 11" and included in the design analysis to document the design options and decisions evaluated during the design process.

3.2 CONSTRUCTION SPECIFICATIONS

3.2.1 Editing Construction Specifications

The Contractor shall use Corps of Engineers' UFGS Guide Specifications for developing construction specifications. Specification paragraphs and subparagraphs shall not be rewritten to lessen the quality of the original guide specification sections. **The specifications shall clearly identify, where appropriate, the specific products chosen to meet the requirements of the Contract (manufacturers' brand names and model numbers or similar product information).** The Contractor shall be responsible for coordinating references, along with the Contract performance requirements, to specific specification sections (number and title) within the construction specifications. See additional requirements in paragraphs DESIGN DEVELOPMENT REQUIREMENTS of this Section and in Section 01012 DESIGN AFTER AWARD, paragraph DESIGN DOCUMENTS.

3.2.1.1 Construction Submittals

The Contractor is responsible for all submittals. See Section 01330 CONSTRUCTION SUBMITTAL PROCEDURES for the definition of Government Approved and For Information Only (FIO) submittals. **Except for appearance-related submittals and those submittals required by Section 01330 CONSTRUCTION SUBMITTAL PROCEDURES to be Government approved ("G"), all other submittals shall be "FIO", that is for information only (Contractor Approved) items. Submittals noted as "G" in the UFGS/UFSWF guides and any RFP technical specifications and which are neither appearance-related nor contractually required to be G shall be changed to "for information only" (Contractor Approved).**

3.2.2 Division 1 Sections

Include Division 1 specifications sections contained in this Contract as part of the project specifications without change. See Section 01012 DESIGN AFTER AWARD.

3.2.3 Format For Construction Specifications

Submit the construction specifications, including cover page and project table of contents. Edit Corps of Engineers UFGS guides using the Corps of Engineers Specsintact software, Version 4.0 or higher. If any commercially available guide specifications are used and are from a relational database system such as BSD SpecLink, then export the sections to Rich Text Format (RTF) word processing files to convert the sections to MS Word documents for those users who are specified to receive MS Word copies of the specifications.

The Corps of Engineers Specsintact software can be downloaded from the Internet at the following address:

[http://kscdl2.ksc.nasa.gov/specsintact/.](http://kscdl2.ksc.nasa.gov/specsintact/)

The Corps of Engineers UFGS Guide Specifications can be downloaded from the Internet at the following address:

<http://64.239.96.52/docs/ufgshome/UFGSToc.htm>

The Lighting Fixture Standard Drawing 40-06-04 Details and Design Criteria (e.g. Unified Facilities Criteria, Army Technical Manuals (TM's), Engineering Manuals, Engineering Technical Letters, Engineer Circulars, Engineer Pamphlets, Design Guides, and Military Handbooks) can be downloaded from the Internet at the following address:

<http://www.hnd.usace.army.mil/techinfo/index.asp>

The guides can only be downloaded in Winzip *.zip files. These are downloadable executable files.

Specsintact software, the UFGS guide specifications, and design criteria manuals can also be obtained from the current version of the Construction Criteria Base CD, issued by the National Institute of Building Sciences, telephone number 202/289-7800, fax number 202-289-1092, internet address is:

<http://www.nibs.org>.

Fort Worth District local guide specifications (UFSWF) and the District

supplements to the UFGS guide specifications are located on the Internet at the following address:

<http://www.swf.usace.army.mil/eandc/ec-a/default.htm>

Print hard copies using laser or ink-jet printer and good quality white paper. For design submittals, editing of the Construction Specifications shall be shown by using redlining (underlined text) for text insertions and strikeouts for text deletions. The corrected 100 percent specifications with review comments incorporated shall be cleaned up (markings for insertion and deletions removed) and submitted in both hard copy and on CD-ROM disk. Carbon copies are not acceptable.

3.2.3.1 Format

Format shall be as specified in Section 01012 DESIGN AFTER AWARD . Sections which are not in the UFGS and Fort Worth District local guide specification series shall be numbered in accordance with CSI MasterFormat. No two sections shall have the same section number.

3.2.5.2 Cover Page

The Cover page shall be similar to the Contract Cover page and shall include:

- a. Project title, activity and location
- b. Construction contract number
- c. Construction Contractor's name and address
- d. Design firm's name and address
- e. Names of design team members responsible for each Contractor prepared technical discipline of the project specification
- f. Name and signature of a Principal of the design firm
- g. The Table of Contents shall list the 16 Divisions contained in CSI format and the specification section numbers and titles contained in the project specification. Do not list in the Table of Contents CSI Divisions that are not required for the project.

3.2.4 Construction Submittals

All construction submittals shall be in accordance with Section 01330, "CONSTRUCTION SUBMITTAL PROCEDURES."

3.2.5 Submittal Register

An electronic version of the ENG Form 4288 is located on the Solicitation and Contract Award CD-ROM disks in folder "Subreg." This version is the

Specsintact DOS Submittal Register program and includes a Readme.txt file. Copy these files to the computer's C:\ drive, remove the read-only attributes, and then double-click on either file "subreg.exe" or on "submit.bat." This is **not** a Windows-based program so the mouse **does not** work. Editing instructions are on-screen, such as press the "F5 (add)" and then the "E" keys to create new empty submittals, the "PgDn" key to complete editing, and the "A" key to accept. For each submittal, fill in the Section Number, Activity Number if applicable, Paragraph Number, Description, Type of Submittal (e.g. SD-01 through SD-11(See Section 01330 CONSTRUCTION SUBMITTAL PROCEDURES)), Classification (e.g. G or FIO), and the Contractor's proposed submittal date. Fill in columns "a" through "o" on the ENG Form 4288 and submit a copy of the "Subreg" folder with the updated files and a hard copy of the register as required for the various construction submittals. A blank MS Excel version of the Form 4288 Submittal Register is also included in the "Subreg" folder and may be used if allowed by the Contracting Officer. This MS Excel file is not compatible with RMS.

3.3 DESIGN ANALYSES

Prepare design analyses (basis of design and calculations) for each design discipline. Specific requirements relative to the technical content to be provided are specified in the paragraphs DESIGN DEVELOPMENT REQUIREMENTS. The design analyses shall be a presentation of facts to demonstrate that the concept of the project is fully understood and that the design is based on sound engineering. The design analysis for each discipline shall be in accordance with Chapter IX of the SWD-AEIM.

3.4 COMMON DESIGN DEFICIENCIES

The work involved in making corrections due to common deficiencies becomes lost effort and time for both the designer and the reviewer. Carefully compare the design and contract documents with all requirements at several points in the design process to avoid unnecessary changes at a later date. Some of the requirements which are most often overlooked include:

- a. Requirements of the COE 2, Southwestern Division's ARCHITECTURAL AND ENGINEERING INSTRUCTIONS MANUAL (SWD-AEIM) have been repeatedly overlooked in the past.
- b. Failure to incorporate the Fort Worth District's supplemental local requirements to the UFGS guide specifications when the UFGS are used.
- c. Not using correct abbreviations or terminology on the drawings. Abbreviations must match what is used on the standard abbreviation sheet and terminology must match what is used in the standard technical guide specifications.
- d. Not using the correct scales, north arrow designation, section cut system, or incomplete dimensioning on the drawings.
- e. Not providing sufficient space for door operation hardware at doors which swing into a wall running perpendicular to the opening. 4 inches minimum is required between edge of door frame and perpendicular walls.
- f. Not providing correct and complete Design Analysis information written in the present tense. The Design Analysis will be written following the format indicated herein. A separate Fire Protection section in the Design Analysis with input from all disciplines is one area which is

often overlooked and shall be included.

g. Not correctly presenting or coordinating (to avoid interference) features of Fire Protection, Noise Control, and Physical Security.

h. Not correctly referencing and cross referencing building sections, wall sections, details, etc.

i. Failure to read and use technical notes in editing the Guide Specifications.

j. Failure to coordinate all disciplines prior to submittal of projects for review.

k. Improper use of fire-retardant wood. Fire-retardant wood is combustible; its use in buildings that are of noncombustible construction is extremely limited (see ICC Bldg Code for the minor allowable uses). Because of the potential for severe degradation, fire retardant plywood shall not be used in a roof or roofing system, or in structural applications.

l. Not listing the ANSI/BHMA numbers in addition to trade names in door hardware specifications and failure to correctly specify hardware finishes.

m. Control joints in CMU walls and brick expansion joints in face brick are not shown on both architectural plans, elevations and structural plans, or are inconsistent. Note also control joint locating and coordination for floor tile per Tile Council of America recommendations.

n. Failure to delete all publications which do not apply to the particular project.

o. North is not oriented the same direction on all sheets (civil, site, arch).

3.5 DESIGN CERTIFICATION

The Contractor shall provide certification for each design submittal in accordance with paragraph SUBMISSION OF CONSTRUCTION DRAWINGS, SPECIFICATIONS AND DESIGN ANALYSES, subparagraph "Certifications," of Section 01012 DESIGN AFTER AWARD.

3.6 DESIGN DEVELOPMENT REQUIREMENTS

All documents shall be 100 percent complete, ready for start of construction. Materials, products, and assemblies to be used shall be identified. Furnish manufacturer's certification that the products and assemblies meet the Buy American Act.

Design documents for each phase shall include all applicable plans, details, and specifications specified in the paragraph DESIGN DETAILS. Identify and resolve conflicts in the design requirements, between the design requirements and the Contractor's design proposal, or those due to lack of thorough understanding of the nature and scope of work prior to submittal. Drawings, design analysis (including ENVIRONMENTAL DESIGN ANALYSIS that addresses issues pertaining to the proposed facility, proposed site, user requirements, and current applicable Federal, state, and local regulations), and specifications will be reviewed for compliance

with the Contract design requirements at this design submittal. Submit the following:

3.6.1 Drawings

Furnish all drawings that are required for the 100 percent submittal and shall be 100 percent complete. The drawings shall be fully coordinated with the design analysis and specifications.

3.6.2 Specifications

Provide all specification sections required for 100 percent submittal. Identify the materials, products, and assemblies to be used. Specifications shall be 100 percent complete. All other specifications required for the completion of the building(s), site work, utilities, turfing, and landscaping shall be at least mark-ups of the required technical and trade sections. The identification of the "author" of the industry guide specifications used, any mandatory guide specifications required in this Contract, and a project table of contents listing all sections in the project shall be submitted with the specifications.

Environmental basic specification sections shall include at least sections such as ENVIRONMENTAL PROTECTION, STORM WATER POLLUTION PREVENTION MEASURES, DUST CONTROL, BASIC STORM WATER POLLUTION PREVENTION PLAN, SWPPP INSPECTION & MAINTENANCE REPORT, RECYCLED/RECOVERED MATERIALS, CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT, and temporary and permanent soil stabilization (i.e. mulching for erosion control, establishment of turf, seeding, topsoil, earthwork, and landscaping). The soil stabilization specifications and method shall be determined with the landscaping project requirement and site applicability.

For a project that requires demolition of existing building structures, inspection, sampling suspicious regulated materials, and quantifying abatement items shall be performed. Sample locations, material descriptions and conditions, analytical results, abatement quantities shall be presented on drawings, and the ENVIRONMENTAL SURVEY PLANS FOR REGULATED MATERIALS. Additional applicable specifications shall include at least ASBESTOS DISTURBANCE (for non-friable ACM) and ASBESTOS ABATEMENT (for friable and non-friable ACM), REMOVAL/CONTROL AND DISPOSAL OF PAINT WITH LEAD, REMOVAL/RECYCLE AND DISPOSAL OF REGULATED MATERIALS. The inspection and sampling protocol, the original analytical lab results shall provide as an attachment as .pdf file to the appropriate sections for reference.

3.6.3 Submittal Register

Prepare a Submittal Register as specified in Section 01330 CONSTRUCTION SUBMITTAL PROCEDURES and paragraph CONSTRUCTION SPECIFICATIONS, subparagraph "Submittal Register," of this Section. Submittals shall be developed to the extent required to support the level of design included in this submittal.

3.6.4 Design Analysis (including Engineering Calculations)

The design analysis shall give the basis for design for all disciplines and shall establish specific goals, objectives, and priorities for the design of this project. Identify, explain, and document use of design criteria and how the design meets goals, objectives, and priorities. The design analysis shall comply with SWD-AEIM, Chapter IX, and include narrative

description and analysis of all building systems, appropriate checklists, calculations, and catalog cut sheets of equipment used in the design. Design analyses shall be performed by licensed design professionals.

3.6.5 Demolition

Provide the site demolition drawings, 100 percent complete, ready to start abatement and demolition work.

a. Site Demolition Drawings (Removal Plan)

Show new work and removal work on separate drawings. The type and the scope of removal work intended shall be clear from an inspection of the documents. Keyed notes for removal are allowed.

The removal plan shall show the existing physical features and condition of the site before construction. Include the field survey to show all above and below ground utilities; buildings, drives, roads and parking areas, walks, and vegetation; and such facilities as retaining walls, underground storage tanks, foundations, existing contours, etc. Each physical feature to be removed shall be as indicated on the standard legend sheet, a legend on the removal plan, and properly noted: to be removed, to remain, or to be relocated.

3.6.6 Civil Design

The drawings shall be 100 percent complete. Drawings shall fully describe the type and the scope of work required. Include all necessary and required details, be thoroughly checked, and be fully coordinated with the Construction Specifications and all other Construction Documents.

3.6.7 Landscaping Design

Provide Landscaping Plan when applicable, including sprinkler system layout, and any details required for this level of design.

3.6.8 Architectural Design

The architectural drawing submittal shall be a complete set of architectural drawings without large scale details. All other drawings shall be complete except referencing of the large scale details. Room finish schedule, and door, window, and louver schedules, shall all be complete except for references to details.

3.6.9 Interior Design

Provide SID Notebook(s) and design analysis.

3.6.10 Structural Design

Provide foundation plans and details which shall be 100 percent complete. Provide details and notes for required structural work. Building structural members shall be at least outlined. Provide elevation views, sections, and details necessary to illustrate the design at a 60 percent level of completion. Roof framing plan(s) shall show sufficient details to clearly indicate the type of framing system used, size, and spacing of members and their elevations.

3.6.11 Mechanical Design

Provide plans, piping diagrams, sections, flow diagrams, details, schedules, and control diagrams/sequences as necessary to define the required design intent at this level of design. Floor plans shall use the architectural floor plans as a basis, with the building outline half-toned.

Unless otherwise indicated, all floor plans shall be drawn at a minimum 1/8-inch = 1'-0" scale and shall show room names and numbers. Provide preliminary mechanical room sections to ensure that major equipment items, piping, and ductwork will fit as designed. For the 60 percent submittal, all supply and return mains shall be shown as double-lined although branch ducts, takeoffs, and ductwork to diffusers may be single-lined. Piping 6 inches and larger shall be shown as double-lined for the 60 percent submittals.

Complete Attachment C for mechanical room sizing.

3.6.12 Electrical Design

Fully coordinate the design drawings with the design analysis. Provide sufficient plans, single-line diagrams, riser diagrams, details, and schedules as necessary to define the required design intent for this level of design. Indicate all circuits, circuit breakers or fuse locations, panelboards, and PDUs known at this level of design.

3.6.13 Fire Protection Design

Provide the Life Safety Plan and the Fire Protection site and floor plans, complete. Fire protection details shall be sufficient for this level of design.

3.6.14 Environmental Design

Provide 100 percent completed document of the following items:

- a. Not Used.
- b. Basic Storm Water Pollution Prevention Plan (edit Section 01421)
- c. Erosion and Sediment Control Plan and Details: Provide layout of existing site features, grading, locations and types of control devices, and construction details sheet.
- d. Design Analysis: Prepare design analysis that discusses installation National Environmental Policy Act (NEPA) document that verifies compliance with Endangered & Threatened Species Act, Cultural & Historical Resource Act, site encroachment of wetlands & floodplains, implications on Section 404 CLEAN WATER ACT, Waters of U.S. (that requires wetland delineation and mitigation design); installation Environmental Baseline Study (EBS) that addresses site contamination from adjacent landfill, fire training pit, vehicle maintenance activities, storage tank of regulated material, soil and ground water; air pollution issues of the proposed facility (i.e. provide emission inventory on proposed equipment for installation TITLE V Federal Air Permit) and during construction, i.e. dust control and TCEQ permit on air emission from construction equipment; water and waste water pollution issues on industrial, potable water quality, storm water management during construction and at finished site (i.e. evaluate if oil water separator is required, construction storm water discharge per

Texas Pollutant Discharge Elimination System (TPDES) Construction Storm Water General Permit TXR 150000 and Section 01421); required pre-construction permits and notifications; regulated materials survey and abatement design on building demolition structures (NOTE: this not required for this project); construction and waste management; Spill Containment Control and Countermeasures requirement for storage tanks with regulated materials (i.e. aboveground or underground storage tanks or transformers), and CALCULATIONS for the specified units of the on-site sewage treatment system or other applicable environmental treatment units (if required for the proposed project).

3.7 CONSTRUCTION DOCUMENT (COMPLIANCE CHECK (FINAL 100 PERCENT DESIGN)) DESIGN REQUIREMENTS

See Section 01012 DESIGN AFTER AWARD for requirements.

3.8 DESIGN DETAILS

Drawings shall include the applicable plans, details, and requirements specified in the SWD-AEIM and those specified below.

3.8.1 Demolition

Show new work and demolition work on separate drawings. The type and the scope of removal work intended shall be clear from an inspection of the documents. Keyed notes for removal will be allowed.

a. Site Demolition Drawings (Removal Plan)

The removal plan shall show the existing physical features and condition of the site before construction. Include the field survey to show all above and below ground utilities; buildings, drives, roads and parking areas, walks, vegetation, and building demolition floor plans; and such facilities as retaining walls, underground storage tanks, foundations, and existing contours. Physical features shall be as indicated and noted: to be removed, to remain, or to be relocated.

b. Building Demolition Drawings (Removal Plan(s))

The type and the scope of removal work intended shall be clear from an inspection of the documents. Show the existing physical features and condition of the site before construction. Show all walls, fixtures, and utilities to be removed. Physical features shall be indicated and noted: to be removed, to remain, or to be relocated.

3.8.2 Civil Design

The drawings shall be complete, fully describing the type and the scope of work required. Include all necessary and required details, thoroughly checked, and fully coordinated with the Construction Specifications and all other Construction Documents. Include the following as applicable:

- Cover Sheet and index of drawings
- Location and vicinity map including haul routes
- Site plan and details
- Grading and drainage plan
- Utility plan with profiles and details
- Pavement plan and details
- Soils boring logs

Landscaping plans and details

a. Location Plan and Vicinity Map

A Vicinity Map consists of a small scale drawing of the project location, similar to a road map. A Location Plan consists of a small scale drawing showing the Government property or reservation limit with the construction project site shown. Show the Contracting Officer-approved Contractor access and haul routes, load limits on bridges along haul routes, and the designated waste and/or borrow areas. Upon request, a reproducible base sheet will be provided by the Fort Worth District for the Contractor's use in preparing the Location Plan.

b. Site Plan

Show all the site layout information necessary to field locate the building, walks, parking lots, and all other appurtenances to be constructed for the project. All site related work to be constructed will be located by dimensions. Identify all site related items such as curbs, pavements, walks, courtyards, bollards, trash enclosures, and retaining walls. Unless otherwise specified, site plans shall be at a scale of 1" = 20' or 1" = 30'. Existing or proposed contours shall not be shown on this Plan. The Site Plan, prior to adding the dimensions, shall serve as the base sheet to the other Plans, such as the Utilities Plan, Grading and Drainage Plans and the Landscape Plan. The Site Plan will show all existing physical features and utilities within and adjacent to the work site that will remain after the proposed construction has been completed. Include free zones, construction limits, storage areas, etc.

Show the building orientation and horizontal dimensional relationships to streets, walks, property lines, easements, fences, and other structures. Space between structures will provide open areas in accordance with good land-use planning and due consideration of future development plans. Maintain fire clearance separations for access for equipment acceptable to the installation (i.e. Fire Chief). Show geometric features of all roads, streets, sidewalks and parking areas. Provide details of all site features.

c. Grading and Drainage Plan

Provide a preliminary grading and drainage plan at a scale of 1" = 20' or 1" = 30' unless otherwise specified. Indicate new and existing grading contours at 1-foot contour intervals. Provide spot elevations in sufficient numbers so that interpolation between contours is not required. Some examples are: corners of paved areas and parking lots, low points, high points, flow lines of ditches and swales, changes in degree of slope and grading at building corners to insure positive drainage from the facility.

Indicate finished floor elevation of new building(s). Finished floor elevations shall be a minimum of 12 inches above the highest point of the outside finished grade and slope away from the building. Grade contours shall be at 1 foot intervals and spot elevations shall be provided at all site development features.

Show layout of the new and existing storm drainage systems, if applicable, including existing and new storm drainage flows, ditches, swales and piped systems.

Provide the appropriate top of structure elevations and pipe invert

elevations of both the new and existing drainage system.

d. Erosion Control Plans

Erosion control plans shall show locations of all sediment (temporary or permanent) basins (or other storm water treatment devices), grassy swale, vegetative filter strips/buffer strips, diversion ditches, areas to receive rock blanket, and other erosion control structures, indicating the approximate drainage areas each will serve. Indicate the materials, construction, and capacity of each structure.

The erosion control plan shall be prepared in accordance with Sustainable Project Rating Tool (SPiRiT). Erosion Control Plans shall be a separate set of plans from the Storm Water Pollution Prevention (SWPP) or Erosion and Sediment Control (ESC) Plans to be implemented during various phases of construction for compliance with Texas Pollutant Discharge Elimination System (TPDES) Construction Storm Water General Permit TXR 150000 as stated in paragraphs 3.6.14 and 3.8.10 Environmental Design, stated herein

e. Composite Utilities Plan With Profiles And Details

If required, provide a Composite Utilities Plan at a scale of 1" = 20' or 1" = 30'. Indicate locations of new and existing utilities. Plans shall show layout of the new and existing storm drainage, gas, sanitary sewer, fire protection, electrical, communication, water, steam, and any other utility systems which need to be provided for. Include new and existing contours. Show mains and distribution lines as well as all appurtenances such as meters, manholes, and valves. If applicable to project, show drinking water well design, wetwells and pump station

f. Grading Sections

Grading sections through the new building showing finished and existing grades may be provided to supplement the required grading plan.

g. Pavement Plan and Details

Provide pavement plans for all parking lots, roads, equipment pads and sidewalks. Include cross sections of all paving designs and include details of curbs, gutters, pads, sidewalks, stairs, inlets and other features.

h. Soils Boring Logs

Provide logs of soil borings provided by the geotechnical engineer.

3.8.3 Landscaping

Provide a Landscape Plan showing trees, shrubs, ground covers, seeded and sodded areas. The Landscape Plan shall be prepared by a Licensed Landscape Architect. The landscape plan shall be in accordance with the AETC/CE Base Architectural Standards of Excellence and the Installation Design Guide. Select and specify types of plant materials that are locally grown, commercially available, and acclimated to the project environment. Include a plant materials schedule or listing which lists the botanical names, common names, key, size, and the method of transplanting for each landscape element. The landscape plan shall also show all unsurfaced ground areas disturbed by construction within the project limits with these areas shown to be seeded, sodded, or mulched as required. Include designs and details

for required site furnishings and accessories.

The Contractor shall provide designs and details as necessary for required site furnishings and accessories.

a. Sprinkler Irrigation Systems

Provide a sprinkler irrigation plan, designating the trees, shrubs, bushes, ground cover, and lawn area to be irrigated. Provide flow and pressure requirements. Include appropriate details.

3.8.4 Architectural Design

a. Floor Plans

Provide double line floor plan(s) of the entire building(s), drawn at the largest scale practicable to include the entire building or floor level on a single sheet. The building footprint may be of a size that will require the floor plans to be divided into multiple areas. Floor plans shall be scaled double-line drawings showing the functional arrangement, structural column or bay indicators, material patterns, location of all openings and plumbing fixtures. Section cuts, wall types, notes and leaders, general notes, and dimensions shall be complete. The plans shall indicate room numbers and titles, door swings, door and window numbers and types. Provide door, window, louver, and other schedules as required. Show a north arrow on each floor plan. Include enlarged toilet room and stair plans. The first floor plan sheet shall include a gross area tabulation comparing the actual square footage with the authorized square footage of the facility. Fully justify architect-engineer suggestions for plan improvement. Include:

- Overall, Control, Opening, and complete dimensioning
- Room Names and Numbers
- Wall and Building section cuts
- Door Swings and Numbers
- Window Types
- Square Footage
- General Notes

Where major structural elements are included as parts of architectural detailing, do not indicate sizes. Define these elements as part of the structural design documents. Major elements of mechanical and electrical equipment affecting space allocation shall be shown on the architectural plan to the extent practicable and coordinated with other respective disciplines. When applicable, Government-furnished, and Contractor-installed, or Government-furnished and installed, items shall be shown as dashed lines.

b. Reflected Ceiling Plans

Reflected ceiling plans shall include all notes, complete legends and pocheing patterns of materials to be used. Provide reflected Ceiling Plans for all spaces in the building(s). Reflected ceiling plans shall show the ceiling tile layout and location of gypsum wallboard and other ceiling types where applicable. Show all light fixtures, air diffusers, grilles, registers, exit lights, public address speakers, fire alarm strobe lights, sprinkler head layout, ceiling mounted equipment access panels or removable ceiling tile and grid elements, smoke and heat detectors, wall fire ratings, ceiling mounted equipment removal pathways, ceiling mounted

television mounts, and other ceiling mounted items. The fixtures and other equipment shall be laid out in a regular pattern symmetrical with the ceiling tile grid, or symmetrical with the room centerlines, columns, windows, or other feature that dominates. All ceiling mounted items shown shall be fully coordinated with all other disciplines.

c. Roof Plan

Roof plan shall be complete showing slopes, locations for roof and overflow drains, equipment, and walkways. Coordinate elements located on the roof with all disciplines.

d. Building Elevations

Provide all building elevations complete showing the appearance and architectural treatment. Elevations shall be dimensioned to show story height, total height, and relation to grade. Indicate critical elevations such as top of finish floor and top of steel

e. Building Sections

Include building cross section and longitudinal sections to show general interior volumes, framing method, relationship to adjacent structures, and height of ceilings and partitions. Identify materials used and necessary dimensions.

f. Wall Sections

Drawings shall include all wall section and stair section conditions, including enclosed corridor(s), showing vertical control elevations and dimensions. Label all materials. Cut sections should through doors, windows, and other critical wall section locations. Wall sections shall not be broken. Include additional details when necessary to illustrate abutting adjacent buildings and important or unusual features. All horizontal dimensions shall occur on the plans and vertical dimensions on the sections and elevations.

g. Room Finish Schedules

Include signage.

h. Door, Window, and Louver Schedules

Door schedule shall include door and frame types and references to door details and hardware sets. Window and louver schedules shall indicate window and louver types, sizes, and references to details.

i. Fire Ratings

Clearly indicate wall ratings and fire hazards as required by the National Fire Protection Association Codes (NFPA). See Unified Facilities Criteria Handbook UFC 3-600-01, particularly Section 2-1 Basic Criteria and Section 2-1.2 Partitions and Military Handbook MIL-HDBK-1191. In addition to the wall rating criteria required by the Codes, provide a minimum of one-hour rated wall assembly around all Janitors Closets, Store Rooms, Mechanical and Electrical Rooms or Closets. Wall fire ratings shall be graphically shown by a continuous symbol or pattern within the wall on the reflected ceiling plan and/or on a Fire Protection/Life Safety Plan. When other functions coexist with the fire protection functions, their integration

shall be clearly indicated with an analysis that describes how both functions will be served. Provide a separate, composite type floor plan which makes an accurate presentation of these various features and functions. By authorized written permission, where the building and features being shown are unusually simple, this information may be included on other drawings. Rated wall details shall include the design number of the testing laboratory certifying the rating.

j. Modular Design

Use modular design practices for the design of all masonry buildings or components of buildings. Dimensions shall be figured to whole or half-unit lengths (in increments of 4 inches) in order to reduce on-site cutting of masonry. Units less than 4 inches long shall be avoided.

k. Room and Door Numbering

The Room and Door Numbering system shall be consistent for all buildings designed under any one contract. Room numbering shall start at the main entrance and proceed clockwise around functional areas.

l. Facility Elevation

The elevation of the first floor shall be indicated as 100 feet and shall be a minimum of 1 foot above finish grade. Elevation for other floors, footings, etc., shall be related to this figure. Sea level elevations shall not be shown on the building drawings. Show elevations of the first floor above sea level on the grading plan (Civil).

m. Access to Utilities

All utilities within the building, such as piping, ductwork, and electrical work, shall be concealed in finished areas unless otherwise specified in the Program and Performance Requirements. Provide plumbing chases in toilet areas. Carefully figure the clear space above ceilings and the size of chases to accommodate piping slopes and connections, ductwork crossovers, and fittings, HVAC piping and valve service spaces, and similar situations. Provide access to valves, cleanouts, etc. Space provided for utilities systems shall be adequate but not excessive.

3.8.5 Interior Design

Furnish Comprehensive Interior Design (CID) Package, including floor plans, finish and color schedules, interior design analysis, and sample/color boards, in accordance with SWD-AEIM, Chapter III, paragraph "Interior Design." SID refers to the building related exterior and interior finishes. CID includes the SID interior design package and the design, selection, arrangement, and color coordination of the furniture, furnishings, and art work. On the floor plan(s), show furnishings that are not considered part of the Contract, such as Government-furnished, Government-installed items, by the use of dashed lines and designated as "Not-In-Contract" (NIC). Use the design analysis to explain the desired image or visual appearance of the interior of the facility.

3.8.5.1 Submittal Requirements for /CID Notebooks (Color/Finish Sample Boards)

a. Furnish 4 sets of color/finish notebook(s) with attached samples of the proposed building-related finish materials mounted on 8-1/2 inch by 11 inch

by 1/16 inch (215 mm by 280 mm by 1.5 mm) thick mat board in three-ring notebooks. Epoxy glue, hot-melt glue, or contact cement shall be used to attach samples; Scotch tape, double-backed tape, or rubber cement will not be acceptable. Heavy samples shall be mechanically fastened. Photographs or colored photocopies are not acceptable.

b. The notebooks shall be labeled on the outside spine and front cover with the phase percentage, CID , project title and location, Contract number, date, and the Contractor's name and address.

c. Sequence and Content of CID Submittal

The sequence and content of CID Submittals shall be as follows:

- (1) Title Page.
- (2) Table of Contents.
- (3) Narrative of Interior Design Objectives.
- (4) Exterior Elevation Drawing.
- (5) Exterior Building Material Legend.
- (6) Exterior Building Material Color Board(s).
- (7) Room Finish Schedules.
- (8) Interior Color Placement Plan.
- (9) Interior Color Notebooks (according to color placement plan).

Each sample shall indicate color, texture, and finish; and, if patterned, shall be large enough to define full pattern. Samples shall be identified as to type of material, area of installation, manufacturer, and transmittal number under which certification of the material represented will be submitted in accordance with the requirements of Section 01330 CONSTRUCTION SUBMITTAL PROCEDURES.

- (10) Interior Floor Plan(s) And Furniture Layout, including an index keyed to the furniture, furnishings, and art work illustration sheets.
- (11) Signage Location Plans(s).
- (12) Interior Signage Color Notebooks.
- (13) and (14) Not Used.
- (15) Furniture and Furnishings Illustration Sheets, Layout for all rooms.

3.8.6 Structural Design

Drawings shall include foundation plans and details, floor framing plans for each floor when applicable, floor slab plans, and roof framing plans.

- a. Show the location of all in-wall columns or pilasters.

b. Foundation and slab plans shall show the size and location of all foundation elements, such as foundation walls, grade beams and footings. Elevations for footings shall be indicated on the plan. Plans for slabs-on-grade and exterior stoop slabs at building entrances shall show location and type of joints, slab thicknesses and reinforcing, elevation of slab surfaces, and any other design features, such as equipment bases, heavy Lab equipments, isolated foundations and the in-slab electrical raceway, which affect the slab design.

c. The sizes, locations, and elevations of footings shall be shown.

d. Coordinate slab plans with the Electrical sheets and indicate the locations of in-slab electrical raceway trench ducts or similar items.

e. Show concrete slab-on-grade thicknesses and sections.

f. Show proposed treatment of special foundations and other unique or complex features and details.

g. Provide elevation views, sections, and details necessary to illustrate the design.

h. Roof framing plans shall show sufficient details to clearly indicate the type of framing system used, size, and spacing of members and their elevations.

i. Drawings shall include overall building plan dimensions, north arrows, and design notes.

j. Grid Systems, Dimensions, and Floor Elevations

Each foundation and slab plan and roof framing plan shall have an alpha-numeric grid system aligned with any in-wall columns or pilasters, or with load bearing and non-load bearing walls, as applicable. The same grid system shall be used for all plan views. Each plan view shown shall have all necessary dimensions. On plan views, the dimensions shall define the location of grid lines, offsets, and all structural elements, as well as the overall sizes of the structure. The finish elevation of the floor slab shall be indicated as 100 feet, and elevations for foundations, walls and roof members shall be referenced to this basic elevation.

k. Plan Sheets

(1) Foundation and Slab Plans

Foundation and slab plans shall show the size and location of all foundation elements, such as foundation walls, grade beams and footings. Elevations for footings shall be indicated on the plan. Plans for slabs-on-grade and exterior stoop slabs at building entrances shall show location and type of joints, slab thicknesses and reinforcing, elevation of slab surfaces, and any other design features, such as equipment bases, heavy Lab equipments, isolated foundations and the in-slab electrical raceway, which affect the slab design.

(2) Roof Framing Plans

Roof framing plans shall be provided for all parts of the structure. Plans shall show the size, spacing, and location of all roof framing members, their supporting in-wall columns, pilasters or walls, all auxiliary members such as bracing and bridging, and the size and location of all major openings through the roof. Plans shall show support system for satellite dishes.

1. Elevation Views, Sections and Details Sheets

Elevation views, sections, and details necessary to illustrate fully the design shall be provided. Some requirements peculiar to the various structural materials are described below.

(1) Concrete

Include elevation views as necessary, plus sections and details to show the outlines of concrete cross-sections, reinforcing bar arrangements, concrete cover for rebar, installation of embedded items, and joint construction. All lap splice and embedment lengths for reinforcing bars shall be clearly indicated on the drawings. A sill detail for each foundation condition at exterior and interior doors shall be provided.

(2) Masonry

Wall reinforcing shall be located and identified on plans, in section cuts, elevation views, or in schedules. When required, include structural elevations to clarify the construction requirements for masonry reinforcement, especially the reinforcement around wall openings. Masonry details may be extracted from ICBO Bldg Code, SWD-AEIM, or other sources and incorporated into the final drawings. Edit the details to reflect the specific requirements of this project.

(3) Structural Steel, Steel Joists, and Steel Decking

Structural steel connections shall be fully detailed and shown on the drawings. The anchorage of beams, trusses, joists, and steel deck to walls or other bearings, and the extra framing or reinforcement required at deck openings shall also be detailed. Notes, details, or schedules on the drawings shall indicate the steel deck attachment method to be used, and shall give the size and spacing for perimeter, side lap, intermediate supports and end lap attachments. Welded connections shall be detailed using standard weld symbols illustrated in AWS D1.1. All applicable weld sizes, spacing, types, contours, and finishes shall be shown.

(4) Cold-Formed Steel Studs

Cold-formed steel connections shall be fully detailed and shown on the drawings. The anchorage of studs to top and bottom runners, of top and bottom runners to supporting members, and the extra framing at openings shall also be detailed. Notes, details, or schedules on the drawings shall indicate the steel stud and runner dimensions, spacing, and attachments.

m. Schedules

(1) Foundation Schedules

Foundation schedules for footings or grade beams shall be included as applicable. The schedule shall include all pertinent information required for the foundation system being used.

(2) Framing Schedules

For concrete framing, beam, and column schedules shall conform to the requirements of the ACI SP-66. For structural steel framing, provide a column schedule complete with design loads at splices, if any, and at column bases, plus a tabulation of the loads, shears, moments and/or axial loads to be resisted by the beams and their connections.

n. Equipment Loads

All equipment loads which exceed 176 pounds and are not supported by concrete slab-on-grade, shall be identified on the drawings by showing equipment locations, total weights, and reaction loads at support points.

o. Notes

(1) Design Notes

Under the heading "Designer's Notes," the structural drawings shall contain notes which begin:

"The structural design was prepared using the following data:".

The data then listed shall include the structural loading criteria used for design, such as roof and floor live loads, snow load design parameters, wind speed and wind load design parameters, seismic design parameters (Zone Z, I, R_w, C, and S values), allowable soil bearing pressures (as recommended by the foundation analysis), foundation design depth, design wind uplift pressures for steel joists and other data pertinent to future alterations. Also, to be listed are the ASTM designations and stress grades of the applicable structural materials: steel, masonry, concrete for each usage, reinforcing bars, and bolts.

(2) General Notes

Other notes, which direct the work to be performed, the materials to be used, etc., shall be grouped under the heading of "General Notes." Include in these notes a description of the building's structural system, if necessary.

3.8.7 Mechanical Design

plans, piping diagrams and isometrics, mechanical room sections, water and air flow diagrams, details, schedules, control diagrams, sequence of operations, etc., as necessary to define the required design intent. Floor plans shall use the architectural floor plans as a basis, with the building outline half-toned. Large-scale plans of congested areas shall be provided. Coordinate with architectural design for provision of access panels for all concealed valves, traps and air vents, etc. Unless otherwise indicated, all floor plans shall be drawn at a minimum 1/8-inch = 1'-0" scale and shall show room names and numbers. Drawings shall include, but not limited to, the following:

a. Mechanical Abbreviation, Legend, and General Notes Sheet

This sheet shall include all mechanical abbreviations and symbols that will be used on the drawings. Include mechanical general installation notes that are required to clarify the construction intent that may not be readily apparent in the specifications or on the drawings. Symbols shall be grouped into sections; as a minimum, provide sections for Plumbing and HVAC. Control drawing symbols shall be shown on a separate drawing.

b. Plumbing Drawings

Plumbing Plans: Plumbing plans show the design and layout of the domestic hot and cold water distribution systems; make-up water piping; soil, waste and vent piping; and storm water drainage system. Include routing of piping systems from the connections within the structure to a point 5 feet outside the structure. The grade of all drain lines shall be calculated and invert elevations established. All plans shall show plumbing fixtures. All electrical panels and equipment and pertinent HVAC equipment (e.g. chillers, expansion tanks, boilers, AHU's, pumps) shall be outlined in half-tone on the plumbing plans. Plans may be drawn at 1/8 inch = 1 foot scale as long as legibility is not compromised. Plumbing fixtures and drains shown on the drawings shall be designated by the same identification system used in the Construction Specification Plumbing Fixture Schedule. Soil, waste, vent and storm drainage piping shall be shown on separate sheets from cold and hot water distribution piping and make-up water piping. Provide a roof plan showing roof drains and sanitary vent penetrations. Include the following:

(1) Enlarged toilet room plans showing all fixtures, water, waste, and vent piping for each toilet area.

(2) Plumbing water and waste/vent riser diagrams for each toilet area. Provide plumbing water and waste/vent riser diagrams for each toilet area.

(3) Enlarged mechanical and boiler room plumbing plans, drawn at a minimum 1/4 inch = 1'-0" scale, showing layout of all plumbing equipment and piping within the rooms. To show spatial relationships, indicate the location of HVAC equipment, gas service, condenser water or chilled water entrances, fire protection entrance and risers, and electrical panels or equipment located in the room.

(4) Plumbing details, including those for roof and overflow drains, and schedules.

c. Mechanical HVAC Drawings, Details, and Schedules

Show on mechanical HVAC drawings, all items of mechanical equipment, including chilled water equipment, condenser water equipment, air handling units, air distribution and exhaust systems, etc., to clearly illustrate all HVAC system designs, and to determine proper space allocation within the intent of the architectural layout requirements. Plans and sections shall be developed sufficiently to ensure that major equipment items, piping, and ductwork cause no interference with structural members, electrical equipment, etc. Provide Schedules for each item of mechanical equipment. Provide installation details showing specification requirements such as isolation and balancing valves, thermometers, pressure gauges,

equipment pads, strainers, vents, hangers, and vibration isolation for each item of mechanical equipment. Include enlarged mechanical and boiler room floor plans showing the layout of all HVAC equipment, piping, and ducts located within the rooms and dedicated access space for items requiring maintenance; and drawn at a minimum 1/4 inch = 1'-0" scale. Provide mechanical and boiler room sections to show equipment and components, ductwork connections and routing, and relationship to adjacent structural features. Provide chilled and hot water system flow diagrams, showing chillers, cooling towers, piping, pumps, boilers, and all connected cooling and heating equipment. Show associated GPM flow rates. Provide airflow diagrams showing CFM quantities for outside air, return air, and supply air; supply-air side of each diagram shall be broken down into zones, with each zone supply, return, and relief/exhaust CFM quantities identified.

Mechanical HVAC Plans: Mechanical HVAC plans shall show the design and layout of the hot water piping distribution system and equipment, chilled water piping distribution system and equipment, condenser water piping distribution system and equipment, air supply and distribution systems, and ventilation and exhaust systems. Air supply and distribution systems shall show all ductwork, including supply and return mains, branch ducts, and terminal unit (single and dual duct VAV and CV boxes) takeoffs; ductwork to diffusers; diffusers, grilles, and registers; and fire and fire/smoke dampers.

d. HVAC Control Drawings

Provide a one-line control diagram showing DDC interface points, detailed sequence of operations, and DDC control points list for all mechanical equipment and systems in accordance with SWD-AEIM, Chapter V.

3.8.8 Electrical Design

Provide plans, electrical and UPS room sections, single-line diagrams, riser diagrams, details, and schedules as necessary to define the required design intent. Coordinate the electrical and communications design with the design for other disciplines. Floor plans shall use the architectural floor plans as a basis with the building outline half-toned. Unless otherwise indicated, all floor plans shall be drawn at a minimum 1/4-inch = 1'-0" scale and shall show room names and numbers. Include the following as applicable:

- a. Electrical Abbreviations and Legends
- b. Drawing Notes
- c. One-Line Diagram

Detail the complete electrical system with a simplified one-line diagram. The diagram shall show ratings of major equipment including short circuit ratings. Use standard symbols for electrical equipment including, but not limited to, switchgear, sectionalizing cabinets, transformers, generators, uninterruptible power systems (UPS), switchboards, panel boards, power distribution units (PDUs), motor control centers (MCCs), motor starters. Include switchgear fuses or circuit breaker ratings; transformer ratings (including K-ratings) and connection configuration; switchboard ratings (including metering); panelboard current and ampere interrupting current (AIC) ratings; PDU ratings (including isolation transformers and K-ratings), raceway and conduit sizes and material type; MCC ratings; motor starter ratings; and conductor and ground type, size, and insulation

ratings.

d. Riser Diagrams

e. Power Plan

Detail the electrical wiring for outlets, including raised floor receptacles, other than lighting. Identify rooms by name and number. When applicable, include a power cable tray plan and communications tray plan, detailing the underfloor cable tray components, outlets, and routing.

f. Lighting Plan

Detail the electrical wiring and switching for lighting. Identify rooms by name and number.

g. Lighting Fixture Schedule

h. Panelboard and PDU Schedules

Detail the circuits and circuit breakers or fuse locations in various panelboards, including panelboards in power distribution units (PDUs). Panelboard schedules shall include the designation, location, mounting (flush or surface), number of phases and wires, voltage, capacity and total connected and demand load. Indicate the trip rating, frame size, interrupting rating, and number of poles for each circuit breaker in the panelboards. List the circuit number, circuit description, and load for each branch circuit. Include estimated maximum demand for each panel and for entire building and other relative information.

i. Emergency Systems

Detail the electrical requirements for emergency systems such as emergency generator, UPS, emergency lighting, and fire alarm system (coordinate with fire protection plans).

j. Site Plan

Detail the connection of pad-mounted switchgear, pad-mounted sectionalizing cabinets, vaults, and underground electrical and communications ducts. Show utilities the underground electric lines and communications ducts will cross.

k. Communications System

Detail the conduit and raceways required to support communications and audio/visual systems requirements, including, but not limited to intercoms, security, cable television, computer data, data transmission (local area network), and telephone.

l. Security System

Detail security camera and alarm requirements, and riser diagrams.

m. Lightning Protection System

Detail the lightning protection system including air terminal types and locations; cross and down conductor material, sizes and connections; ground rod material, sizes, and locations; ground counterpoise materials, sizes,

and routing, and test well construction and locations. Show locations of all air terminals, roof conductors, down conductors, ground rods, and counterpoise.

n. Grounding System

Show locations for and detail grounding electrode; grounding conductor and bond materials, sizes, and locations; and isolation grounds.

o. Cathodic Protection System

Detail test point construction and locations, sacrificial anode systems, impressed current systems, etc.

p. Miscellaneous Details

Provide communications manhole details, electric vault details, special light fixture details, etc.

3.8.9 Fire Protection Design

Provide plans, diagrams, sections, and details as necessary to define the required design intent. Floor plans shall use the architectural floor plans as a basis, with the building outline half-toned. Unless otherwise indicated, floor plans shall be drawn at a minimum 1/8 inch = 1'-0" scale and shall show room names and numbers. Drawings shall include, but not limited to, the following:

a. Fire Protection Plans

Show the following on the fire protection plans:

- fire service entry and size to a point 5 feet outside of building;
- back flow preventer and size;
- system riser and size;
- zone risers, fire department connection, alarm bell, detectors, zones, room by room occupancy hazards and ceiling types per zone in tabular format, general description of system, applicable NFPA codes listing, sprinkler type per ceiling and application;
- water demand data, including design density, hose allowance, and design area for each applicable occupancy hazard; and
- a note stating that system shall be hydraulically designed.

Plans shall not show sprinkler piping or heads, unless it is necessary for coordination or system definition in special applications.

b. Fire Protection Details

Include the following fire protection details:

- mechanical riser diagram, including all pipe sizes;
- electrical riser diagram;
- any necessary sections to show routing of piping or sprinkler head locations, fire service entrance detail, exterior wall and slab penetration details, hydraulic design data from flow test provided by Government, hydrant designations from flow test, and fire protection symbols list.

c. Site Plan

Include:

- underground fire service main routing and size, from point of connection at existing water main, to building entry point;
- and fire hydrant locations used in flow test.

Label fire hydrants to match flow test designations shown on drawings and described in design analysis.

d. Life Safety Plan

Show:

- location of fire separation walls, column, floor and roof protection,
- path of travel for emergency egress and panic exits,
- access to building for fire fighting,
- rated doors and windows,
- requirement for mechanical and electrical penetrations through fire separation walls and floors,
- placement of fire extinguishers, and
- occupancy types.

3.8.10 Environmental Design

Provide the following items:

Environmental Survey Sampling Plan

Storm Water Pollution Prevention (SWPP) or Erosion and Sediment Control (ESC) Plan

The Contractor shall submit for Government review and approval a basic storm water pollution prevention plan, 100 percent complete, and is developed in accordance with Section 01421 BASIC STORM WATER POLLUTION PREVENTION PLAN to prevent storm water pollution and implement Best Management Practices, inspection and maintenance for compliance with Texas Pollutant Discharge Elimination System (TPDES) Construction Storm Water General Permit TXR 150000.

The Contractor shall discuss type of erosion and sediment control structures in Sections 01356 and 01421, and provide drawings to show applicable construction DETAILS of erosion and sediment control structures to be established on-site prior to soil disturbing activities at various phases of construction.

Design Analysis

The Contractor shall prepare a Chapter in the Design Analysis (100 percent design) entitled: "Environmental Protection Compliance". This Chapter shall summarize how the project complies with all environmental laws and regulations per paragraph ENVIRONMENTAL DESIGN. This is in addition to Design Analysis content required per paragraph ENVIRONMENTAL DESIGN, the Chapter shall include the following:

- a. The Permitting and/or Approving Authority(ies) for submittal of permits and notifications.

b. Construction/Operating Permits, Notices, Reviews and/or Approvals required. If, when checking with the agencies, a permit, notice or approval is not required, include a copy of the telephone conversation memorandum or letter from the agency.

c. Time required by the permitting agency, or agencies, to process the application(s) and issue the permits.

d. Fee schedule including filing/application fees, review fees, emissions fees, certification testing, etc.

e. Monitoring and/or compliance testing requirements.

f. Actual Environmental regulations governing the applications, exemptions, variances, etc. or at a minimum a brief summary of the regulation and title.

3.9 **ATTACHMENTS**

Attachments A, B, and C follow this page.

3.9.1 **ATTACHMENT A**

CODE ANALYSIS

INTERNATIONAL BUILDING CODE (IBC) AND NFPA "LIFE SAFETY CODE" ANALYSIS

LIFE SAFETY AND FIRE PROTECTION IS AN INTEGRAL PART OF EVERY FACILITY DESIGN. RECOGNIZED CODES AND ACCEPTED SAFETY STANDARDS SHALL BE FOLLOWED IN THE DESIGN OF ALL FACILITIES. OF THE VARIOUS CODES AND SAFETY STANDARDS THE NATIONAL FIRE PROTECTION ASSOC. (NFPA) "LIFE SAFETY CODE" SHALL TAKE PRECEDENCE. ALL APPLICABLE REQUIREMENTS OF THE LIFE SAFETY CODE SHALL BE INCORPORATED INTO EACH DESIGN. FOR TYPE OF CONSTRUCTION, FIRE AREA LIMITATIONS, AND ALLOWABLE BUILDING HEIGHTS THE DESIGN SHALL FOLLOW THE INTERNATIONAL BUILDING CODE (IBC).

CHECK LIST

PROJECT NAME _____ DATE _____
 LOCATION _____

3.9.1.1 BUILDING CODE ANALYSIS

a. OCCUPANCY CLASSIFICATION (See Table 5A):

Area:	Classification:
(GROUP: _____):	Div. _____
(GROUP: _____):	Div. _____
(GROUP: _____):	Div. _____

PRINCIPAL OCCUPANCY _____

OTHERS (SPECIFY) _____

b. TYPE OF CONSTRUCTION :

c. OCCUPANCY SEPERATION REQUIRED (SEE TABLE 5-B):

_____	TO _____	= _____	HRS
_____	TO _____	= _____	HRS
_____	TO _____	= _____	HRS
_____	TO _____	= _____	HRS

d. FIRE RESISTANCE OF EXTERIOR WALLS: (SEE TABLE 5-A)

NORTH _____

SOUTH _____
EAST _____
WEST _____
OTHER _____

e. OPENINGS IN EXTERIOR WALLS: (SEE TABLE 5-A)

NORTH _____
SOUTH _____
EAST _____
WEST _____
OTHER _____

f. MAX. ALLOWABLE FLOOR AREA (SEE TABLE 5-C):

ALLOWABLE:

IF SPRINKLERED: _____

ALLOW. AREA INCREASES _____

CALCULATED ACTUAL FLOOR AREA:

Floor	Square Footage
-------	----------------

Totals:

g. MAX. ALLOWABLE HEIGHT (SEE TABLE 5-D):

METERS (FEET): _____

STORIES: _____

Proposed Height of Building: _____

Actual No. of Stories: _____

h. COMMENTS:

DESIGNER: _____

3.9.1.2 NFPA 101 "LIFE SAFETY CODE"

a. CLASSIFICATION OF OCCUPANCY:

HAZARD OF CONTENTS:

LOW

ORDINARY

HIGH

b. FIRE RESISTIVE REQUIREMENTS:

EXTERIOR WALLS: _____ HRS _____

INTERIOR WALLS: _____ HRS _____

STRUCTURAL FRAME: _____ HRS _____

VERTICAL OPENINGS: _____ HRS _____

FLOORS: _____ HRS _____

ROOFS: _____ HRS _____

EXTERIOR DOORS: _____ HRS _____

EXTERIOR WINDOWS: _____ HRS _____

BOILER ROOM ENCLOSURE _____ HRS _____

OTHER (LIST) _____ HRS _____

_____ HRS _____

_____ HRS _____

_____ HRS _____

c. MEANS OF EGRESS:

OCCUPANCY LOAD FACTOR: _____

OCCUPANCY	FACTOR	ACTUAL AREA	ACTUAL LOAD

d. NUMBER OF EXITS REQUIRED:

e. MINIMUM WIDTH OF EXITS:

CALCULATED:

ACTUAL:

f. MAXIMUM ALLOWABLE TRAVEL DISTANCE TO EXIT:

WITH SPRINKLERS:

g. EXIT DOORS:

MINIMUM WIDTH ALLOWED:

MAXIMUM LEAF WIDTH ALLOWED:

WIDTH REQUIRED FOR NO.OF OCCUPANTS:

h. EXIT CORRIDORS:

MAX. COMMON PATH OF TRAVEL:

MINIMUM ALLOWABLE WIDTH:

REQUIRED TO HAVE EXIT AT EACH END OF CORRIDOR?

DEAD END CORRIDORS ALLOWED? _____

MAXIMUM LENGTH: _____

WALL FIRE RESISTANCE REQUIRED: _____

DOORS & FRAME FIRE RESISTANCE REQUIRED:

i. STAIRS:

MINIMUM WIDTH _____ FOR OCCUP. LOAD OF _____

MINIMUM WIDTH _____ FOR OCCUP. LOAD OF _____

MINIMUM WIDTH _____ FOR OCCUP. LOAD OF _____

MINIMUM WIDTH _____ FOR OCCUP. LOAD OF _____

MAX. RISER ALLOWED: _____

MINIMUM TREAD ALLOWED: _____

LANDINGS:

MIN. SIZE: _____

MAX. VERTICAL DIST. BETWEEN LANDINGS: _____

REQUIRED HEIGHT OF RAILINGS:

HANDRAILS:

REQUIRED AT EACH SIDE? _____

INTERMEDIATE RAIL REQUIRED? _____

HEIGHT ABOVE NOSING _____

INTERMEDIATE RAIL REQUIRED? _____

MAX. SPACE ALLOWED BETWEEN RAILS: _____

STAIR ENCLOSURE REQUIRED? _____

STAIR TO ROOF REQUIRED? _____

STAIR TO BASEMENT REQUIRED? _____

j. HATCHWAY ACCESS TO ROOF REQUIRED? _____

k. LADDER ACCESS TO ROOF REQUIRED?

l. HORIZONTAL EXIT REQUIREMENTS:

m. PROTECTION OF OPENINGS NEAR EXTERIOR STAIR EXIT DOORS:

n. SMOKEPROOF ENCLOSURE REQUIRED:

o. RAMPS:

MAX. SLOPE TO USE AS EXIT _____
HANDRAILS REQUIRED? _____

p. COMMENTS:

DESIGNER: _____

FOLLOWING IS A LIST OF ADDITIONAL "NFPA" CODES THAT ARE COMMONLY USED.
INDICATE WHICH OF THESE CODES ARE USED AND ADD THOSE REQUIREMENTS TO THIS
ANALYSIS.

UFC 3-600-01 DESIGN: FIRE PROTECTION ENGINEERING FOR FACILITIES
NFPA 10 FIRE EXTINGUISHERS, PORTABLE
NFPA 75 COMPUTER/DATA PROCESSING FACILITIES
NFPA 80 FIRE DOORS AND WINDOWS
NFPA 88A PARKING STRUCTURES
NFPA 409 AIRCRAFT HANGARS
AFM 88-4 DATA PROCESSING FAC. DESIGN AND CONST.
AF ETL 89-3 FIRE PROTECTION CRITERIA FOR ELECTRONIC

Typed Name and Signature of the
Licensed Architect/Engineer of Record
Professional Seal of the Licensed Architect/Engineer of Record

3.9.2 **ATTACHMENT B****ADA ARCHITECTURAL DESIGN CHECKLIST**

Project Name: _____

Project Location: _____

Design Phase: _____

ITEM

INCORP N/A

LATER

NO.

1. Established with the Base/owner of the facility the requirements for handicap accessibility. _____
2. Received a waiver for no handicap accessibility requirements on the facility. _____
3. Facility is designed utilizing:

New Construction Criteria	_____	_____	_____
Building Alteration Criteria	_____	_____	_____
Historic Building Preservation Criteria:	_____	_____	_____
4. Accessible Route (egress/corridors/halls/aisles).

- Provided minimum fire egress routes.	_____	_____	_____
- Provided minimum site accessible routes.	_____	_____	_____
- Provided proper clearance widths.	_____	_____	_____
- Provided proper floor level changes.	_____	_____	_____
- Provided proper floor materials.	_____	_____	_____
- Provided protection from protruding objects.	_____	_____	_____
5. Ramps:

- Maximum slopes less than 1:12	_____	_____	_____
- Maximum run less than 30 feet for 1:12 slopes	_____	_____	_____
- 40 feet for 1:16 slopes	_____	_____	_____
- Minimum clear width exceeds 36-inches.	_____	_____	_____
- Provided proper edge protection.	_____	_____	_____
- Provided handrails of proper configuration and diameter.	_____	_____	_____
- Provided proper handrail extensions at top and bottom of ramp.	_____	_____	_____
- Provided handrails at proper mounting heights.	_____	_____	_____
- Provided proper landings.	_____	_____	_____
- Provided proper cross slope on ramp surface.	_____	_____	_____

ITEM
 INCORP
 N/A
 LATER
 NO.

6. Stairs:

- Protected the space below stairs from access by the blind. _____
- Provided handrails of proper configuration and diameter. _____
- Provided proper handrail extensions at top and bottom of stairs. _____
- Provided handrails at proper mounting heights. _____
- Provided treads greater than 11-inches in width. _____
- Provided Proper nosings. _____

7. Elevators:

- Provided buttons and lanterns at the proper mounting height. _____
- Provided Braille characters. _____
- Provided proper door widths. _____
- Provided proper clearance inside elevator car. _____

8. Doors And Hardware:

- Provided proper door widths. _____
- Provided proper clearance on both sides of jambs. _____
- Entrance vestibules provided with adequate clearances. _____
- Provided levers on locksets and exit hardware. _____
- Provided closers with mechanical adjustments. _____
- Provided accessible thresholds. _____
- Provided protection plates on doors heavily used by wheel chair bound people. _____

ITEM INCRP NO.	N/A	LATER
----------------------	-----	-------

- | | | | | |
|-----|--|-------|-------|-------|
| 9. | Toilet Facilities: | | | |
| | - Provided proper floor clearance through out the toilet rooms. | _____ | _____ | _____ |
| | - Provided minimum number of required accessible fixtures. | _____ | _____ | _____ |
| | - Provided accessible toilet stalls. | _____ | _____ | _____ |
| | - Provided stall doors with correct direction of swing. | _____ | _____ | _____ |
| | - Provided accessible water closets. | _____ | _____ | _____ |
| | - Provided grab bars at accessible water closets. | _____ | _____ | _____ |
| | - Provided grab bars with correct configuration and dimension. | _____ | _____ | _____ |
| | - Provided accessible sinks/lavatories. | _____ | _____ | _____ |
| | - Provided accessible urinals. | _____ | _____ | _____ |
| | - Provided accessible water coolers and fountains. | _____ | _____ | _____ |
| | - Provided accessible mirrors. | _____ | _____ | _____ |
| | - Provided accessible toilet accessories at required locations. | _____ | _____ | _____ |
| | - Provided all fixtures and accessories at proper mounting heights and clearances. | _____ | _____ | _____ |
| | - Provided insulated or protected exposed pipes at lavatories. | _____ | _____ | _____ |
| 10. | Shower/Tub Facilities: | | | |
| | - Provided the minimum number of accessible showers/tubs. | _____ | _____ | _____ |
| | - Provided showers/tubs with grab bars. | _____ | _____ | _____ |
| | - Provided showers/tubs with seats as required. | _____ | _____ | _____ |
| | - Provided controls mounted at the proper height and location. | _____ | _____ | _____ |
| | - Provided proper clearances and dimensions in showers/tubs. | _____ | _____ | _____ |
| | - Provided proper floor clearance through out shower/tubs rooms. | _____ | _____ | _____ |
| | - Provided doors with correct direction of swing and clearance. | _____ | _____ | _____ |

ITEM NO.		INCORP	N/A	LATER
11.	Storage:			
	- Provided accessible cabinets, shelves, closets, and drawers as required.	_____	_____	_____
	- Provided proper clearance, mounting heights, and reach provisions.	_____	_____	_____
12.	Telephones and Vending:			
	- Provided the minimum number of required accessible public telephones.	_____	_____	_____
	- Provided proper floor clearance around telephone.	_____	_____	_____
	- Phone and controls mounted at proper heights and within reach.	_____	_____	_____
	- Provided vending machines on an accessible route.	_____	_____	_____
	- Provided vending machines with accessible clearances and protruding object safe guards.	_____	_____	_____
13.	Fixed Or Built-in Seating And Tables:			
	- Provided the minimum number of accommodations for accessibility in areas which required fixed furniture.	_____	_____	_____
	- Provided proper floor clearance around furniture.	_____	_____	_____
	- Provide proper knee space at tables.	_____	_____	_____
	- Provided tables and counters with proper top surface heights.	_____	_____	_____
14.	Assembly Areas:			
	- Provided the minimum number of accessible seating spaces.	_____	_____	_____
	- Provided seating which is easily accessible to emergency egress.	_____	_____	_____
	- Provided companion seating.	_____	_____	_____
	- Integrated and dispersed accessible seating with the rest of the seating.	_____	_____	_____
	- Provided accessible dressing rooms.	_____	_____	_____
	- Provided level floor surface at accessible seat locations.	_____	_____	_____
	- Provided clear ground or floor space at accessible seat locations	_____	_____	_____
	- Provided access to all performing areas and associated spaces.	_____	_____	_____

ITEM NO.		INCORP	N/A	LATER
15.	Dining Halls And Cafeterias:			
	- Provided the minimum number of accessible dining spaces.	_____	_____	_____
	- Provided accessible counters and bars.	_____	_____	_____
	- Provided accessible aisles between tables or walls.	_____	_____	_____
	- Provided clear floor space at accessible dining locations.	_____	_____	_____
	- Provided accessible food service lines meeting minimum clearances and reaches.	_____	_____	_____
	- Provided accessible tableware and condiment areas.	_____	_____	_____
	- Provided raised speaker platform with protected edges.	_____	_____	_____
16.	Medical Care Facilities:			
	- At least 10% of the general patient rooms are accessible.	_____	_____	_____
	- Provided the number of accessible patient rooms as required for specialized treatment, long term care, or alterations of existing patient rooms.	_____	_____	_____
	- Provided at least one accessible entrance with weather protecting canopy or roof overhang.	_____	_____	_____
	- Provided minimum clearances within the patient rooms and around the beds.	_____	_____	_____
	- Provided accessible patient toilet/bath rooms.	_____	_____	_____
17.	Business And Mercantile:			
	- Provided at least one accessible sales counter, services counter, teller, information window, etc.	_____	_____	_____
	- Security bollards when provided, do not prevent access or egress to people in wheel chairs.	_____	_____	_____
18.	Libraries:			
	- Provided access to all reading and stack areas, reference reference rooms, reserve areas, and special facilities or collections.	_____	_____	_____
	- Provided at least 5% or a minimum of one of each element or fixed seating, tables, or study carrels as accessible	_____	_____	_____
	- Provided at least one lane of check out areas as accessible.	_____	_____	_____
	- Provided adequate clearance and reach distances at card catalogs and magazine displays.	_____	_____	_____
	- Provide stacks with minimum clear aisle width.	_____	_____	_____

ITEM NO.		INCORP	N/A	LATER
19.	Temporary Lodging:			
	- All common and public use areas are accessible.	_____	_____	_____
	- Provided accessible units, sleeping rooms, and suites.	_____	_____	_____
	- Provided sleeping accommodations for persons with hearing impairments.	_____	_____	_____
	- Provided a dispersed class and a range of room options.	_____	_____	_____
	- Provided accessible rooms in ADAL projects.	_____	_____	_____
	- Provided an accessible route to accessible sleeping rooms.	_____	_____	_____
	- Provided accessible clearance widths within sleeping rooms and around beds.	_____	_____	_____
	- Provided accessible doors within accessible sleeping rooms.	_____	_____	_____
	- Provided accessible fixed or built-in furniture and storage units.	_____	_____	_____
	- Provided accessible controls throughout accessible units.	_____	_____	_____
	- Where provided as part of an accessible unit each of the following were provided as accessible: living area, dining area, at least one sleeping area, patio/terrace, balcony, toilet/bath, and carport/garage/parking.	_____	_____	_____
	- Where provided as apart of an accessible unit, the kitchen, kitchenettes, wet bars, or similar amenities were also provided with accessible features.	_____	_____	_____
	- Provided visual alarms, notification devices, and accessible telephones.	_____	_____	_____
	- Provided accessible doors and doorways designed to allow passage into and within all sleeping units or other covered units.	_____	_____	_____

20. Transportation Facilities:

(This section covers Air, Rail, and Bus public transportation facilities. See Section 10 of the ADA Guide for specific requirements for these facilities)

3.9.3 ATTACHMENT C

MECHANICAL ROOM SIZE FORM

NOTE: Mechanical Systems Design Documents and Guides -
Mechanical Room Size Form

At the final design stage, the mechanical designer shall
fill out this Mechanical Room Size Form and include it in
the final design calculations.

Project:

Location:

Engineer:

Gross floor area of building:

Gross square footage includes (the entire building) stairs, corridors, etc.

Floor area of mechanical room:

Percent of gross building area is the mechanical room size:

Type of facility:

Sources of energy (E, G, S):

Mechanical equipment:

List of equipment outside the mechanical room and location:

Is the mechanical room too small?

Does the User think the mech room is too small? (Y, N, Don't know)

Additional remarks:

Abbreviations:

AC - air compressor
AHU - air handling unit
B - boiler
CU - air cooled condensing unit
DF - direct fired
DX - direct expansion chilled water heat exchanger
E - electric
FC - fan coil unit
FP - fire protection
G - natural gas or propane
HX - heat exchanger

LC - liquid chiller
MUA - make up air unit
UH - unit heater
ST - domestic hot water storage tank
S - steam

-- End of Section --

SECTION 01320F

PROJECT SCHEDULE

PART 1 GENERAL

1.1 QUALIFICATIONS

The Contractor shall designate a scheduler who shall be responsible for the preparation of the project schedule and periodic updates. The Scheduler shall have three years of experience in construction scheduling, estimating, cost management, and impact/change order analysis. The Scheduler shall have the responsibility of coordinating and updating the schedule and providing required updates in a timely manner. (AM#2) This Scheduler shall be a full time employee whose sole responsibility will be scheduling and who shall be on the site at all times during progress of the work. Qualifications of this individual shall be submitted to the Contracting Officer for review and approval with the Offeror's management/technical proposal submission. ~~Qualifications of the scheduler shall be submitted to the Contracting Officer for review with the Preliminary Project Schedule submission.~~

1.2 SEQUENCING AND PHASING

The maintenance of traffic flow onto the Fort and through the various construction sites shall be given a high priority. As a result, the Contractor shall prepare a construction schedule that will consider the sequence and phasing of construction at the various sites in order to maintain the flow of traffic.

1.2.1 Sequencing

Fort Hood has 45 buildings to receive partial renovations, 5 new tracked vehicle maintenance sheds (TVMs), 1 new battalion classroom building, 1 new unit storage building, 1 new covered storage area, 4 new asphalted hardstand areas, 2 new POV parking areas, 4 asphalt overlays of existing hardstands, and 10 re-locatable vehicle maintenance structures with supporting utilities.

The function of each of these buildings and sites are key factors in deciding the construction priorities. The priorities are listed below:

Priority 1 - Buildings 9418, 9419, 9421, 9422, 9426, 9427, 10016, 10018, 10020, 10021, 10022, 4614, 4615, 4616, 4617, 9410, 10003, 10033, 16010, 87009, 90038, 9420, Site 1 (S-1 DOL Hardstand/Cover), Site 2 (S-2 LZ Phantom Hardstand), Site 3 (S-3 49000 Block Hardstand), Site 4 (S-4 4920 Block Overlay), Site 5 (S-5 4926 Block Overlay), Site 6 (S-6 Motor Pool Road Hardstand), Site 8 (S-8 16000 Block Classroom), Site 9 (S-9 17000 Block Storage), Site 10 (S-10 1900 Block Hardstand).

Priority 2 - Buildings 10001, 10004, 10005, 10006, 10007, 10008, 10009, 10010, 10011, Site 11 (S-11 TVN 41st), Site 12 (S-12 TVN 37th), Site 13 (S-13 TVN 27th), Site 14 (S-14 TVN 25th), Site 15 (S-15 TVN 16th).

Priority 3 - Buildings 9413, 9423, 9424, 9425, 10002, 10040, 10045, 12002, 12003, 12004, 12008, 12010, 12019, 12020, Site 16 (S-16 Murphy Loop Parking South), Site 17 (S-17 Murphy Loop Parking North), Site 18 (S-18 7000 Block Overlay South), Site 19 (S-19 7000 Block Overlay North).

Priority 4 - Site 3-R1 (S-3-R1 Vehicle Maintenance), Site 3-R2 (S-3-R2 Vehicle Maintenance), Site 4-R1 (S-4-R1 Vehicle Maintenance), Site 4-R2 (S-4-R2 Vehicle Maintenance), Site 4-R3 (S-4-R3 Vehicle Maintenance), Site 4-R4 (S-4-R4 Vehicle Maintenance), Site 5-R1 (S-5-R1 Vehicle Maintenance), Site 5-R2 (S-5-R2 Vehicle Maintenance), Site 10-R-1 (S-10-R1 Vehicle Maintenance), Site 10-R-2 (S-10-R2), Site 7 (S-7 72nd & Terminal Hardstand).

Priority 5 - Relocation and furniture.

The renovations and miscellaneous sites are to placed into phases and grouped as follows:

Phase I - Buildings 9418, 9419, 9421, 9422, 9426, 9427, 10016, 10018, 10020, 10021 and 10022.

Phase II - Buildings 4614, 4615, 4616, 4617, 9410, 10003, 10033 16010, 87009 and 90038.

Phase III - Buildings 9420, 10001, 10004, 10005, 10006, 10007, 10008, 10009, 10010, 10011.

Phase IV - Buildings 9413, 9423, 9424, 9425, 10002, 10040, 10045, 12002, 12003, 12004, 12008, 12010, 12010, 12019 and 12020.

Phase V - Site 1, Site 2, Site 4, Site 4-R1, Site 4-R2, Site 4-R3, Site 4-R4, Site 5, Site 5-R1 and Site 5-R2.

Phase VI - Site 3, Site 3-R1, Site 3-R2, Site 6, Site 10, Site 10-R1 and Site 10-R2.

Phase VII - Site 8 and Site 9.

Phase VIII - Site 11, Site 12, Site 13, Site 14 and Site 15.

Phase IX - Site 16, Site 17, Site 18, Site 19.

1.2.1.1 Logic of Sequence, Required Completion & Liquidated Damages

Commence, prosecute, and complete the work under this contract in accordance with the following schedule and Section 00800 SPECIAL CONTRACT REQUIREMENT clauses COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK and LIQUIDATED DAMAGES:

This project is to be constructed as shown in the following Flow Diagram with the building renovations and the sites grouped into nine (I-IX) phases with the described logic of sequence and with the required completion dates after the notice to proceed (NTP) is issued for the basic contract. The contract schedule as described further in this specification section shall also include the phases, logic of sequence and the required completion times as described below.

Flow Diagram:

 Phase I
 Basic Contract NTP

→ 9418

→ 9419

→ 9422	→ 9421	
→ 9427	→ 9426	
→ 10016	→ 10018	
→ 10022	→ 10021	→ 10020

Phase II

Basic Contract NTP	→ 4614
	→ 4615
	→ 4616
	→ 4617
	→ 9410
	→ 10003
	→ 10033
	→ 16010
	→ 87009
	→ 90038

Phase III

Basic Contract NTP	→ 120 Calendar Days	→ 9420
		→ 10001
		→ 10004
		→ 10005
		→ 10006
		→ 10007
		→ 10008
		→ 10009
		→ 10010
		→ 10011

Phase IV

Basic Contract NTP	→ 300 Calendar Days	→ 9413
		→ 9423
		→ 9424
		→ 9425
		→ 10002
		→ 10040
		→ 10045
		→ 12002
		→ 12003
		→ 12004
		→ 12008
		→ 12010
		→ 12019
		→ 12020

Phase V

Basic Contract NTP	→ Site 1	→ Site 5
		→ Site 5-R1
		→ Site 5-R2
	→ Site 2	→ Site 4
		→ Site 4-R1
		→ Site 4-R2
		→ Site 4-R3
		→ Site 4-R4

Phase VI

Basic Contract NTP → Site 3
 → Site 3-R1
 → Site 3-R2
 → Site 6
 → Site 10
 → Site 10-R1
 → Site 10-R2

Phase VII

Basic Contract NTP → Site 8
 → Site 9

Phase VIII

Basic Contract NTP → Site 11
 → Site 12
 → Site 13
 → Site 14
 → Site 15

Phase IX

Basic Contract NTP → Site 16
 → Site 17
 → Site 18
 → Site 19

1.2.1.1.1 Defined Logic of Sequence

A note that dictates how the work shall proceed further defines each of the following sequences.

Phase I:

NTP → Building 9418 → Building 9419
 Note: Renovation of Building 9419 is not to start until two weeks after completion and acceptance of Building 9418.
NTP → Building 9422 → Building 9421
 Note: Renovation of Building 9421 is not to start until two weeks after completion and acceptance of Building 9422.
NTP → Building 9427 → Building 9426
 Note: Renovation of Building 9426 is not to start until two weeks after completion and acceptance of Building 9426.
NTP → Building 10016 → Building 10018
 Note: Renovation of Building 10018 is not to start until two weeks after completion and acceptance of Building 10016.
NTP → Building 10022 → Building 10021 → Building 10020
 Note: Renovation of Building 10020 is not to start until two weeks after completion and acceptance of Building 10021.
 Renovation of Building 10021 is not to start until two weeks after completion and acceptance of Building 10022.

Phase II:

NTP → Building 4614
NTP → Building 4615
NTP → Building 4616
NTP → Building 4617
NTP → Building 9410
NTP → Building 10003
NTP → Building 10033
NTP → Building 16010

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NTP → Building 87009

NTP → Building 90038

Note: No special notes for all buildings in Phase II.

Phase III:

NTP → 120 Calendar Days → Building 9420

NTP → 120 Calendar Days → Building 10001

NTP → 120 Calendar Days → Building 10004

NTP → 120 Calendar Days → Building 10005

NTP → 120 Calendar Days → Building 10006

NTP → 120 Calendar Days → Building 10007

NTP → 120 Calendar Days → Building 10008

NTP → 120 Calendar Days → Building 10009

NTP → 120 Calendar Days → Building 10010

NTP → 120 Calendar Days → Building 10011

Note: Renovation of all the buildings in Phase III are not to start until one-hundred-twenty (120) calendar days after basic contract Notice to Proceed.

Phase IV:

NTP → 300 Calendar Days → Building 9413

NTP → 300 Calendar Days → Building 9423

NTP → 300 Calendar Days → Building 9424

NTP → 300 Calendar Days → Building 9425

NTP → 300 Calendar Days → Building 10002

NTP → 300 Calendar Days → Building 10040

NTP → 300 Calendar Days → Building 10045

NTP → 300 Calendar Days → Building 12002

NTP → 300 Calendar Days → Building 12003

NTP → 300 Calendar Days → Building 12004

NTP → 300 Calendar Days → Building 12008

NTP → 300 Calendar Days → Building 12010

NTP → 300 Calendar Days → Building 12019

NTP → 300 Calendar Days → Building 12020

Note: Renovation of all the buildings in Phase IV are not to start until three hundred (300) calendar days after basic contract Notice to Proceed.

Phase V:

NTP → Site 1 → Site 5

Note: Construction work on Site 5 is not to start until 2 weeks after completion and acceptance of Site 1.

NTP → Site 1 → Site 5-R1

Note: Construction work on Site 5R-1 is not to start until 2 weeks after completion and acceptance of Site 1.

NTP → Site 1 → Site 5-R2

Note: Construction work on Site 5R-2 is not to start until 2 weeks after completion and acceptance of Site 1.

NTP → Site 2 → Site 4

Note: Construction work on Site 4 is not to start until 2 weeks after completion and acceptance of Site 2.

NTP → Site 2 → Site 4-R1

Note: Construction work on Site 4-R1 is not to start until 2 weeks

after completion and acceptance of Site 1.

NTP → Site 2 → Site 4-R2

Note: Construction work on Site 4-R2 is not to start until 2 weeks after completion and acceptance of Site 2.

NTP → Site 2 → Site 4-R3

Note: Construction work on Site 4-R3 is not to start until 2 weeks after completion and acceptance of Site 2.

NTP → Site 2 → Site 4-R4

Note: Construction work on Site 4-R4 is not to start until 2 weeks after completion and acceptance of Site 2.

Phase VI:

NTP → Site 3

NTP → Site 3-R1

NTP → Site 3-R2

NTP → Site 6

NTP → Site 10

NTP → Site 10-R1

NTP → Site 10-R2

Note: No special notes for all sites in Phase VI.

Phase VII:

NTP → Site 8

NTP → Site 9

Note: No special notes for all sites in Phase VII.

Phase VIII:

NTP → Site 11

NTP → Site 12

NTP → Site 13

NTP → Site 14

NTP → Site 15

Note: No special notes for all sites in Phase VIII.

Phase IX:

NTP → Site 16

NTP → Site 17

NTP → Site 18

NTP → Site 19

Note: No special notes for all sites in Phase IX.

1.2.1.1.2 Defined Required Completion and Liquidated Damages

All work is to be done in sequence as defined in the above paragraphs and to be completed within the duration allocated within the contract schedule. The renovation of each of the buildings, the construction of the independent sites, and the re-locatable structures are each considered separate items of work within the contract and each have separate contract completion times from the basic contract Notice to Proceed (NTP). Each of these items of work have separate liquidated damages associated with them and will be

assessed as determined by the Contracting Officer for failure to deliver the items of work within the time frame allocated as described below:

Item Of Work	Commencement Of Work	Completion Of Work In Calendar Days From Basic Contract NTP	Liquidated Damages Per Calendar Day
Building 4614 (Renovate for Admin)	Immediately after Basic Contract NTP	one-hundred-forty-one (141 days)	\$5,000.00
Building 4615 (Renovate for Admin)	Immediately after Basic Contract NTP	one-hundred-forty-three (143 days)	\$5,000.00
Building 4616 (Renovate for Admin)	Immediately after Basic Contract NTP	one-hundred-forty-six (146 days)	\$5,000.00
Building 4617 (Renovate for Admin)	Immediately after Basic Contract NTP	one-hundred-forty-eight (148 days)	\$5,000.00
Building 9410 (Renovate for Battalion Aid Sta.)	Immediately after Basic Contract NTP	one-hundred-nineteen (119 days)	\$5,000.00
Building 9413 (Renovate for 6 Company Ops)	Work to start 300 days after Basic Contract NTP	four-hundred-eight (408 days)	\$5,000.00
Building 9418 (Renovate for 3 Company Ops)	Immediately after Basic Contract NTP	one-hundred-six (106 days)	\$5,000.00
Building 9419 Renovate for 2 Company Ops & 1 Battalion HQ)	To start two weeks after completion and acceptance of Building 9418	two-hundred-thirty-one (231 days)	\$5,000.00
Building 9420 (Renovate for 2 Company Ops & 1 Battalion HQ)	Work to start 120 days after Basic Contract NTP	two-hundred-thirty-eight (238 days)	\$5,000.00
Building 9421 (Renovate for 1 Company Ops & 1 Battalion HQ)	To start two weeks after completion and acceptance of Building 9422	two-hundred-thirty-four (234 days)	\$5,000.00
Building 9422 (Renovate for 3 Company Ops)	Immediately after Basic Contract NTP	one-hundred-eight (108 days)	\$5,000.00
Building 9423 (Renovate for 3 Company Ops)	Work to start 300 days after Basic Contract NTP	four-hundred (400 days)	\$5,000.00
Building 9424 (Renovate for	Work to start 300 days after Basic	four-hundred-one	

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4 Company Ops)	Contract NTP	(401 days)	\$5,000.00
Building 9425 (Renovate for 3 Company Ops)	Work to start 300 days after Basic Contract NTP	four-hundred (400 days)	\$5,000.00
Building 9426 (Renovate for ½ Company Ops)	To start two weeks after completion and acceptance of Building 9427	two-hundred-forty-five (245 days)	\$5,000.00
Building 9427 (Renovate for ½ Company Ops)	Immediately after Basic Contract NTP	one-hundred-twenty-one (121 days)	\$5,000.00
Building 10001 (Renovate for 2 Company Ops & ½ Battalion HQ)	Work to start 210 days after Basic Contract NTP	three-hundred-two (302 days)	\$5,000.00
Building 10002 (Renovate for 2 Company Ops & ½ Battalion HQ)	Work to start 300 days after Basic Contract NTP	four-hundred-thirty-five (435 days)	\$5,000.00
Building 10003 (Renovate for 2 Company Ops & ½ Battalion HQ)	Immediately after Basic Contract NTP	one-hundred-sixteen (116 days)	\$5,000.00
Building 10004 (Renovate for 2 Company Ops & ½ Battalion HQ)	Work to start 210 days after Basic Contract NTP	three-hundred-four (304 days)	\$5,000.00
Building 10005 (Renovate for 3 Company Ops)	Work to start 210 days after Basic Contract NTP	three-hundred-twenty-two (322 days)	\$5,000.00
Building 10006 (Renovate for 2 Company Ops & ½ Battalion HQ)	Work to start 210 days after Basic Contract NTP	three-hundred-seven (307 days)	\$5,000.00
Building 10007 (Renovate for 2 Company Ops & ½ Battalion HQ)	Work to start 210 days after Basic Contract NTP	three-hundred-nine (309 days)	\$5,000.00
Building 10008 (Renovate for 3 Company Ops)	Work to start 210 days after Basic Contract NTP	three-hundred-thirteen (313 days)	\$5,000.00

Completion
 Of Work In
 Calendar Days Liquidated

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Item Of Work	Commencement Of Work	From Basic Contract NTP	Damages Per Calendar Day
Building 10009 (Renovate for 2 Company Ops & 1 Battalion HQ)	Work to start 210 days after Basic Contract NTP	three-hundred-sixteen (316 days)	\$5,000.00
Building 10010 (Renovate for 2 Company Ops & ½ Battalion HQ)	Work to start 210 days after Basic Contract NTP	three-hundred-eighteen (318 days)	\$5,000.00
Building 10011 (Renovate for 2 Company Ops & ½ Battalion HQ)	Work to start 210 days after Basic Contract NTP	three-hundred-twenty (320 days)	\$5,000.00
Building 10016 (Renovate for 2 Company Ops)	Immediately after Basic Contract NTP	one-hundred-thirteen (113 days)	\$5,000.00
Building 10018 (Renovate for 2 Company Ops & ½ Battalion HQ)	To start two weeks after completion and acceptance of Building 10016	two-hundred-forty-three (243 days)	\$5,000.00
Building 10020 (Renovate for 2 Company Ops & 1 Battalion HQ)	To start two weeks after completion and acceptance of Building 10021	three-hundred-eleven (311 days)	\$5,000.00
Building 10021 (Renovate for 2 Company Ops & 1 Battalion HQ)	To start two weeks after completion and acceptance of Building 10022	two-hundred-eleven (211 days)	\$5,000.00
Building 10022 (Renovate for 3 Company Ops)	Immediately after Basic Contract NTP	one-hundred-eleven (111 days)	\$5,000.00
Building 10033 (Renovate for Server Room)	Immediately after Basic Contract NTP	two-hundred-thirty-six (236 days)	\$5,000.00
Building 10040 (Renovate for Admin)	Work to start 300 days after Basic Contract NTP	four-hundred-forty-five (445 days)	\$5,000.00
Building 10045 (Renovate for 1 Company Ops)	Work to start 300 days after Basic Contract NTP	four-hundred-forty-seven (447 days)	\$5,000.00
Building 12002 (Renovate for 5 Company Ops)	Work to start 300 days after Basic Contract NTP	four-hundred-ten (410 days)	\$5,000.00
		Completion Of Work In Calendar Days	Liquidated

Item Of Work	Commencement Of Work	From Basic Contract NTP	Damages Per Calendar Day
Building 12003 (Renovate for 3 Company Ops)	Work to start 300 days after Basic Contract NTP	four-hundred-thirty-seven (437 days)	\$5,000.00
Building 12004 (Renovate for 3 Company Ops)	Work to start 300 days after Basic Contract NTP	four-hundred-thirty-nine (439 days)	\$5,000.00
Building 12008 (Renovate for 3 Company Ops)	Work to start 300 days after Basic Contract NTP	four-hundred-forty-three (443 days)	\$5,000.00
Building 12010 (Renovate for 5 Company Ops)	Work to start 300 days after Basic Contract NTP	four-hundred-twelve (412 days)	\$5,000.00
Building 12019 (Renovate for 5 Company Ops)	Work to start 300 days after Basic Contract NTP	four-hundred-fourteen (414 days)	\$5,000.00
Building 12020 (Renovate for 5 Company Ops)	Work to start 300 days after Basic Contract NTP	four-hundred-sixteen (416 days)	\$5,000.00
Building 16010 (Renovate for Company Ops/HQ)	Immediately after Basic Contract NTP	one-hundred-thirty-six (136 days)	\$5,000.00
Building 87009 (Renovate for 2 Battalion HQ)	Immediately after Basic Contract NTP	one-hundred-twenty-three (123 days)	\$5,000.00
Building 90038 (Renovate for Admin)	Immediately after Basic Contract NTP	one-hundred-thirty-eight (138 days)	\$5,000.00
Site 1 (DOL Hardstand & Cover)	Immediately after Basic Contract NTP	one-hundred-five (105 days)	\$2,500.00
Site 2 (LZ Phantom Hardstand)	Immediately after Basic Contract NTP	ninety (90 days)	\$2,500.00
Site 3 (49000 Block Hardstand)	Immediately after Basic Contract NTP	seventy-five (75 days)	\$2,500.00
Site 3-R1 (Vehicle Maintenance)	Immediately after Basic Contract NTP	ninety (90 days)	\$2,500.00
		Completion Of Work In Calendar Days	Liquidated

Item Of Work	Commencement Of Work	From Basic Contract NTP	Damages Per Calendar Day
Site 3-R2 (Vehicle Maintenance)	Immediately after Basic Contract NTP	one-hundred-five (105 days)	\$2,500.00
Site 4 (4920 Block Hardstand)	To start two weeks after completion and acceptance of Site 2	one-hundred-fifty (150 days)	\$2,500.00
Site 4-R1 (Vehicle Maintenance)	To start two weeks after completion and acceptance of Site 2	one-hundred-fifty (150 days)	\$2,500.00
Site 4-R2 (Vehicle Maintenance)	To start two weeks after completion and acceptance of Site 2	one-hundred-fifty (150 days)	\$2,500.00
Site 4-R3 (Vehicle Maintenance)	To start two weeks after completion and acceptance of Site 2	one-hundred-fifty (150 days)	\$2,500.00
Site 4-R4 (Vehicle Maintenance)	To start two weeks after completion and acceptance of Site 2	one-hundred-fifty (150 days)	\$2,500.00
Site 5 (4926 Block Hardstand)	To start two weeks after completion and acceptance of Site 1	one-hundred-sixty-five (165 days)	\$2,500.00
Site 5-R1 (Vehicle Maintenance)	To start two weeks after completion and acceptance of Site 1	one-hundred-sixty-five (165 days)	\$2,500.00
Site 5-R2 (Vehicle Maintenance)	To start two weeks after completion and acceptance of Site 1	one-hundred-sixty-five (165 days)	\$2,500.00
Site 6 (Motor Pool Road Hardstand)	Immediately after Basic Contract NTP	sixty (60 days)	\$2,500.00
Site 8 (16000 Block Classroom)	Immediately after Basic Contract NTP	one-hundred-sixty-five (165 days)	\$2,500.00
Site 9 (17000 Block Unit Storage)	Immediately after Basic Contract NTP	one-hundred-sixty-five (165 days)	\$2,500.00
Site 10 (1900 Block Hardstand)	Immediately after Basic Contract NTP	one-hundred-ninety-five (195 days)	\$2,500.00
		Completion Of Work In Calendar Days	Liquidated

Item Of Work	Commencement Of Work	From Basic Contract NTP	Damages Per Calendar Day
Site 10-R1 (Vehicle Maintenance)	Immediately after Basic Contract NTP	one-hundred-ninety-five (195 days)	\$2,500.00
Site 10-R2 (Vehicle Maintenance)	Immediately after Basic Contract NTP	one-hundred-ninety-five (195 days)	\$2,500.00
Site 11 (41 st Street TVM)	Immediately after Basic Contract NTP	one-hundred-fifty (150 days)	\$2,500.00
Site 12 (37 th Street TVM)	Immediately after Basic Contract NTP	one-hundred-sixty-five (165 days)	\$2,500.00
Site 13 (27 th Street TVM)	Immediately after Basic Contract NTP	one-hundred-eighty (180 days)	\$2,500.00
Site 14 (25 th Street TVM)	Immediately after Basic Contract NTP	one-hundred-ninety-five (195 days)	\$2,500.00
Site 15 16 th Street TVM)	Immediately after Basic Contract NTP	two-hundred-ten (210 days)	\$2,500.00
Site 16 (Murphy Loop Parking South)	Immediately after Basic Contract NTP	thirty (30 days)	\$2,500.00
Site 17 (Murphy Loop Parking North)	Immediately after Basic Contract NTP	forty-five (45 days)	\$2,500.00
Site 18 (7000 Block Overlay South)	Immediately after Basic Contract NTP	two-hundred-ten (210 days)	\$2,500.00
Site 19 (7000 Block Overlay North)	Immediately after Basic Contract NTP	two-hundred-forty (240 days)	\$2,500.00

1.2.2 Phasing of the renovation of buildings and construction of sites.

The schedule shall be developed to show the phasing of the renovation of each building and the construction at each site. Work hours for the renovation of the buildings are 0800 hrs to 2000 hrs Monday through Friday and 0900 hrs to 1800 hrs Saturday. No work shall be done, or workers in and around the buildings, other than the hours stated above. Standard 40-hour work week shall apply to all other work areas. Additional time may be authorized, if needed, with a 48-hour advance notice to the Government.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that

will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 CONSTRUCTION SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittal

Network Diagram; G, RE

The diagram shall show a continuous activity flow from left to right. The diagrams shall be 36x48, minimum size unless explicitly modified by the Contracting Officer. The diagrams shall be legible, shall have activities 'grouped' or 'banded' by Project area, building or feature, and shall contain the following information:

- a. Activity number
- b. Activity description
- c. Duration in workdays
- e. Total float in workdays
- f. Logic ties
- h. Clearly marked critical path (s)
- i. 'Banded' or 'grouping' identification on each sheet
- j. Composed and/or milestone dates
- k. Scale of sufficiently large scale to render a legible diagram

Dates shall be shown on the diagram for start of the project, any milestones required by the contract, and contract completion. The critical path shall be clearly identified. Submittal, review, procurement, fabrication, delivery, installation, start-up, and testing of special or long lead-time materials and equipment shall be included in the NAS diagram. Government and other agency activities shall be shown. These include but are not limited to: notice to proceed, approvals, inspections, and utility tie in for phasing requirements.

Reports; G, RE.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS, a Project Schedule as described below shall be prepared. The scheduling of construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Designers, subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule, scheduling personnel, or approved periodic schedule updates will result in an inability of the Contracting Officer to evaluate Contractor's progress for the purposes of payment. In this event, progress payments will not be made until corrective action is taken and the schedule

is approved by the Contracting Officer. The contractor's pay estimates shall be based upon the amount of work completed as agreed upon between Government and Contractor personnel during the Periodic Progress Meetings further specified below.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in the Precedence Diagram Method (PDM)

3.3.2 Level of Detail Required

The Project Schedule shall be at a level of detail appropriate for the size and complexity of the project. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule:

3.3.2.1 Activity Durations

Contractor submissions shall follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods (usually less than 2 percent of the durations all non-procurement activities' are greater than 20 days).

3.3.2.2 Project Activities, General

Project activities consist of all construction activities, including design-related activities, mobilization, demobilization, placement of warranty tags, O&M manuals, jobsite clean-up, and required testing and training. Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. These procurement tasks include, but are not limited to: submittals, approvals, procurement, fabrication, delivery, installation, start-up, testing, and training.

3.3.2.3 Critical Activities

The following activities shall be listed as separate line activities on the Contractor's project schedule:

- a. Submission of mechanical/electrical layout drawings.
- b. Submission and approval of O & M manuals.
- c. Submission and approval of as-built drawings.

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- d. Submission of 1354 data and installed equipment lists.
- e. Submission and approval of testing and air balance (TAB)
- f. Submission of TAB specialist design review report.
- g. Submission and approval of testing and balancing of HVAC plus commissioning plans and data.
- h. Air and water balance dates.
- I. HVAC commissioning dates.
- j. Controls testing plan.
- k. Controls testing.
- l. Performance Verification testing.
- m. Other systems testing, if required.
- n. Prefinal inspection.
- o. Correction of punchlist from prefinal inspection.
- p. Final inspection.

3.3.2.4 Government Activities

Government and other agency activities that could impact progress shall be shown. These activities include, but are not limited to: the review of Government-approved submittals, approvals, inspections, utility tie-in, Government Furnished Equipment (GFE), and Notice to Proceed (NTP) for phasing requirements.

3.3.2.5 Responsibility

All activities shall be identified in the project schedule by the party responsible for performing the work. Responsibility includes, but is not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

3.3.2.6 Work Areas

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

3.3.2.7 Modification or Claim Number

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number. Whenever possible, changes shall be added to the schedule by adding new activities. Existing activities shall

not normally be changed to reflect modifications.

3.3.2.8 Bid Item

All activities shall be identified in the project schedule by the Bid Item to which the activity belongs. An activity shall not contain work in more than one bid item. The bid item for each appropriate activity shall be identified by the Bid Item Code.

3.3.2.9 Phase of Work

All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not contain work in more than one phase of work. The project phase of each activity shall be identified by the unique Phase of Work Code.

3.3.2.10 Category of Work

All activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited, to the procurement chain of activities including such items as submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

3.3.2.11 Feature of Work (Work Breakdown Structure(WBS))

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to, a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code or WBS Code.

3.3.2.12 Resources

All appropriate activities shall be assigned resources (labor, materials, equipment) that are expected to be used during the execution of the activity.

3.3.2.13 Costs

All work activities shall be cost-loaded with the amount budgeted. The sum of all activities in the schedule shall equal the total contract amount.

3.3.2.14 Design and Permit Activities

The Contractor shall integrate design and permitting activities, including necessary conferences, follow-up actions, and design package submission dates, into the schedule. These activities shall be coded to designate design and permitting.

3.3.2.15 Data Dictionary

The Contractor shall submit a coding scheme that shall be used throughout the project for all activity codes contained in the schedule. The coding scheme submitted shall list the values for each activity code category and translate those values into project specific designations. For example, a Responsibility Code Value, "ELE", may be identified as "Electrical Subcontractor." Activity code values shall represent the same information throughout the duration of the contract.

3.3.3 Scheduled Project Completion

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date on which the NTP was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have an AES@ constraint date equal to the date that the NTP was acknowledged, and a zero day duration. It is possible for submittal activities to be started before NTP. If started, such activities will not alter the Contract start date or completion time for the Contract.

3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the currently approved contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted in the narrative report at every project schedule update period to assist the Contracting Officer in evaluating the Contractor's ability to actually complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim phasing completion dates shall be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date. Activities with separate completion dates shall also be constrained to show negative float if the completion date is not met.

3.3.4.1 Start Phase

The Contractor shall include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the NTP was acknowledged, and a zero day duration.

3.3.4.2 End Phase

The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the completion date for the phase of the project, and a zero day duration.

3.3.4.3 Phase X

The Contractor shall include a hammock type activity for each project phase

called "Phase X" where "X" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Program features which calculate one of these parameters from the other shall be disabled.

3.3.6 Out-of-Sequence Progress

Activities that have posted progress without all preceding logic being satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case approval of the Contracting Officer. The Contractor shall propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule. If approval is not given, a revised schedule that reflects corrections to the original logic to show the current sequence of activities shall be submitted prior to payment being made for those items of work.

3.3.7 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS. A data disk and a printed, legible network diagram are required for each submission. Submissions shall contain the same level of detail as is being used by the contractor for project management.

3.4.1 Preliminary Project Schedule Submission

The Preliminary Project Schedule shall be submitted within 21 days of NTP defining the Contractor's planned operations, including a detailed 100% design schedule and a summary of the balance of the project. The Government shall have 30 days for review. Upon review and acceptance of the Contracting Officer, this schedule shall be used for analysis and payment purposes until submittal of the Initial Schedule (see paragraph entitled "Initial Project Schedule Submission"). Upon submittal and approval, the updated initial schedule shall be used for payment purposes. The schedule shall include significant activities with milestone dates including:

- Contract Notice to Proceed
- Phases as specified in contract
- Preliminary and Initial Schedule Submittal dates
- Design Submittal Dates
- Government Review Periods
- Review Conference Dates
- Resubmittal of Final Design/Construction Documents
- Government Review of Final Design/Construction documents Construction

Closeout Activities

(e.g., operation and maintenance manuals, record drawings testing of equipment and systems, prefinal inspection procedures, and correction of deficiencies, and final cleanup)

Commissioning of HVAC Systems

Substantial Completion

No payment will be made until this schedule is accepted.

3.4.2 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 14 calendar days after NTP. The schedule shall provide a logical sequence of activities which represent work activities through the entire project and shall be at an appropriate level of detail as defined in paragraph PROJECT SCHEDULE. The Government has 14 days for approval.

3.4.2.1 Operations and Maintenance Manuals

Include activities on the Schedule for turn-over to the Government of the required number of copies of approved O&M manuals for all specification sections and for Operation and Maintenance training classes. The completion date for submittal of O & M Manuals 120 calendar days prior to the final acceptance inspection date. The amount to be withheld until completion and approval of these activities will be the amount indicated on the Bidding Schedule for "Operation and Maintenance Manuals."

3.4.2.2 Warranty Work

Include an activity subsequent to Project Transfer on the Schedule for Warranty Work. This activity shall be for a period of 365 days.

3.4.3 Periodic Schedule Updates

The Contractor shall submit periodic updates as required by the Contracting Officer. Updated data discussed in the periodic progress meetings will be the basis for the schedule updates. These submissions shall enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgment of the Contracting Officer or authorized representative, is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.4 Not Used

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the preliminary submission, initial submission, and every periodic project schedule update throughout the life of the project:

3.5.1 Data Disks

Three data disks containing the project schedule shall be provided. The automated scheduling software utilized by the Contractor shall be capable of direct data input into the scheduling system currently in use by the Government. The Government (e.g. the Fort Worth District) currently uses Primavera for Windows, Version 3.1, subject to current update. The

Contractor will be responsible for the accuracy of this data and successful data transfer to the Government. In the event of faulty disk(s), the Contractor will be responsible for replacement.

3.5.1.1 File Medium

Required data shall be submitted on CD-ROM disk or 3.5 high-density diskette, formatted under Windows 95, 98, NT, or 2000, unless otherwise approved by the Contracting Officer.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the scheduling program used, format of data transfer (P3, PRX, STX, or MPX), file name, the type of schedule (Preliminary, Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number or person responsible for the schedule, and the MS-DOS version used to format the disk.

3.5.1.3 File Name

Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with the preliminary, initial, and each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the 2 most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken to maintain and/or regain schedule. This report shall be provided for use with the updated schedule in evaluating current progress and as an indicator of upcoming progress. This report shall also accompany pay requests for payment evaluation, or required to be taken. The narrative report is expected to relay to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the periodic schedule updates. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The software program used for scheduling shall be capable of producing the reports as listed. The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number and then sorted according to Early Start Date. For completed activities, the Actual Start Date shall be used as the secondary sort.

3.5.4.2 Logic Report

A list of Preceding and Succeeding activities for every activity in ascending order by activity number. Preceding and succeeding activities shall include all information listed above in paragraph Schedule Reports. A blank line shall be left between each activity grouping.

3.5.4.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates. Completed activities shall not be shown on this report.

3.5.4.4 Earnings Report

A compilation of the Contractor's Total Earnings on the project from the NTP until the most recent Monthly Progress Meeting.

3.5.5 Network Diagram

The network diagram shall be required on the preliminary and initial schedule submission and on periodic schedule update submissions. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. Activity numbers, descriptions, durations, milestones and constraint dates shall be shown, and the critical path shall easily be apparent. The network diagram must be legible in its electronic form, or another means of production shall be required subject to Contracting Officer approval. Legibility shall be determined upon submission of the Preliminary Schedule. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be coded so that banding is possible to assist in understanding the activity sequence. Typically, this flow will group activities by phase, category of work, work area, and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.5.5.6 Open Ends

Open Ended Activities other than the first and last activities, "Start Project" and "End Project", shall only be used with approval of the Contracting Officer.

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss progress or payment shall be at regular intervals mutually agreed to at the pre-construction conference. During these meetings the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. During meetings the Contracting Officer will approve activity progress, proposed revisions, and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager, Quality Control Manager or staff, and Scheduler shall attend the periodic progress meeting along with similar representation by the Government.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 7 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date shall be subject to the approval of the Contracting Officer. As a minimum, the Contractor shall address the following items on an activity by activity basis during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish dates for each activity currently in progress or completed

3.6.3.2 Duration

The estimated Remaining Duration for each activity in progress. Calculations shall be based on Remaining Duration in applicable work periods for each activity.

3.6.3.3 Earnings

The earnings for each activity started. Payment will be based on earnings for each in-progress or completed activity. Payment for individual activities will not be made for work that contains quality defects. A portion of the overall project amount may be retained based on lack of satisfactory progress.

3.6.3.4 Logic Changes

All logic changes pertaining to NTP on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary. 3) Changes required to correct a schedule which does not represent the actual or planned prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

Any request for a time extension from the Contractor, whether as a result of added or changed work due to a modification, a differing site condition, or unusually severe weather, shall be accompanied by justification, project schedule data and supporting evidence as the Contracting Officer may deem necessary for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

- a. A list of affected activities.
- b. A brief explanation of the causes of the change.
- c. An analysis of the overall impact of the change proposed.
- d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.1 Not Used

3.7.2 Not Used

3.7.3 Additional Submission Requirements

For any requested time extension of over 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting

Officer within 7 calendar days of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, the Contractor shall advise the Contracting Officer within 7 calendar days of receipt of the revisions, Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 7 calendar days of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officers proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor. Use of Zero Free Float and Zero Total Float constraints shall not be allowed.

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SECTION 01330

CONSTRUCTION SUBMITTAL PROCEDURES
AM #0002

PART 1 GENERAL

1.1 SUBMITTAL IDENTIFICATION (SD)

Submittals required are identified by SD numbers and titles as follows:

SD-01 Preconstruction Submittals

Certificates of insurance.
Surety bonds.
List of proposed subcontractors.
List of proposed products.
Construction Progress Schedule.
Submittal register.
Schedule of values.
Health and safety plan.
Work plan.
Quality control plan.
Environmental protection plan.

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports

Daily checklists

Final acceptance test and operational test procedure

SD-07 Certificates

Statements signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

Confined space entry permits.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or

material, including special notices and Material Safety Data sheets concerning impedances, hazards and safety precautions.

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

Factory test reports.

SD-10 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism, such as:

- Record (e.g. As-built) drawings.
- Special warranties.
- Posted operating instructions.
- Training plan.

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.2.1 Designer of Record Approved

Designer of Record approval is required for extensions of design, critical materials, any deviations from the solicitation, the accepted proposal, or the completed design, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", they are considered to be "shop drawings". The Contractor shall provide the Government the number of copies designated hereinafter of all Designer of Record approved submittals. The Government may review any or all Designer of Record approved submittals for conformance to the Solicitation and Accepted Proposal. The Government will review all submittals designated as deviating from the Solicitation or Accepted Proposal, as described below. Design submittals shall be in accordance with Section 01012 DESIGN AFTER AWARD. Generally, design submittals should be identified as SD-05 DESIGN DATA submittals.

1.2.2 Government Approved

Government approval is required for any deviations from the Solicitation or Accepted Proposal and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and

Drawings for Construction," they are considered to be "shop drawings."

1.2.3 Government Reviewed Design or Extension of Design

The Government will review all design submittals for conformance with the technical requirements of the solicitation. Section 01012 DESIGN AFTER AWARD covers the design submittal and review process in detail. Government review is required for extension of design construction submittals, used to define contract conformity, and for deviation from the completed design. Review will be only for conformance with the contract requirements. Included are only those construction submittals for which the Designer of Record design documents do not include enough detail to ascertain contract compliance. The Government may, but is not required, to review extensions of design such as structural steel or reinforcement shop drawings.

1.2.4 Information Only

All submittals not requiring Designer of Record or Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.3 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that design, general method of construction, materials, detailing and other information appear to meet the Solicitation and Accepted Proposal. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for design, dimensions, all design extensions, such as the design of adequate connections and details, etc., and the satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.4 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer, obtain the Designer of Record's approval when applicable, and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. Any "information only" submittal found to contain errors or unapproved deviations from the Solicitation or Accepted Proposal shall be resubmitted as one requiring "approval" action, requiring both Designer of Record and Government approval. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Contracting Officer.

1.4.1 Government Comments

For disapproved submittals, the Contractor shall provide resubmittals with all data necessary to show compliance with Government comments.

1.5 WITHHOLDING OF PAYMENT

No payment for materials incorporated in the work will be made if all required Designer of Record or required Government approvals have not been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.6 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager and the Designer of Record, if applicable, and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.7 SUBMITTAL REGISTER

The Designer of Record shall develop a complete list of submittals during design. The Designer of Record shall identify required submittals in the specifications, and use the list to prepare the Submittal Register. The list may not be all inclusive and additional submittals may be required by other parts of the contract. The Contractor is required to complete the submittal register and submit it to the Contracting Officer for approval within 30 calendar days after Notice to Proceed. The approved submittal register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period. The submit dates and need dates used in the submittal register shall be coordinated with dates in the Contractor prepared progress schedule. Updates to the submittal register showing the Contractor action codes and actual dates with Government action codes and actual dates shall be submitted monthly or until all submittals have been satisfactorily completed. When the project schedule is revised, the submittal register shall also be revised and both submitted for approval.

1.8 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of ~~60~~[AM #0002] 14 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals. An additional 7 calendar days shall be allowed and shown on the register for review and approval of submittals for food service equipment and refrigeration and HVAC control systems.

1.9 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms are included in the QCS software that the Contractor is required to use for this contract. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

1.10 SUBMITTAL PROCEDURES

Submittals shall be made as follows:

1.10.1 Procedures

The Government will further discuss detailed submittal procedures with the Contractor at the Post-Award Conference.

1.10.1.1 Additional Instructions

In addition to the requirements of this Section, additional instructions are specified in the attachment "INSTRUCTIONS TO CONTRACTORS FOR TRANSMITTAL REQUIRMENTS" located at the end of this section.

1.10.1.2 Contractor Review

The Contractor's quality control representative shall review the listing at least every 30 days and take appropriate action to maintain an effective and updated system. A copy of the register or progress schedule shall be maintained at the job site. Revised and/or updated register or progress schedule shall be submitted to the Contracting Officer at least every 60 days in quadruplicate (complete register need not be provided, only those portions containing additions or changes).

1.10.1.3 Number of Copies

The Contractor shall provide five (5) sets of all submittals unless otherwise specified.

1.10.1.4 Address to Receive Submittals

Submittals, regardless of reviewer designation, shall be sent to the Corps of Engineers' Area Office assigned to the project.

1.10.1.5 Additional Government Approved Submittals

In addition to those specified in PART 1 paragraph SUBMITTAL CLASSIFICATION, the following classifications of submittals also require Governmental approval:

a. Fire Protection and Detection Submittals

The Contractor shall prepare and submit, as one integrated submittal, shop drawings for the fire protection/detection system. This submittal shall also include sprinkler plans and sections, fire detection and alarm plans and risers, and catalog cuts of proposed equipment. ~~The Contractor shall submit proof that the shop drawings were prepared by an engineer regularly engaged in fire protection/detection systems for at least 2 years, and that they are sealed by a registered professional engineer.~~ **[AM #0002] The fire protection and detection system integrated submittal shall be reviewed and sealed by a registered professional engineer regularly engaged in fire protection/detection systems for at least 5 years. The registered professional engineer shall ensure and certify that the integrated submittal is complete, complies with required NFPA's, all devices are provided and monitored as required by contract, and in compliance with the contract documents. The registered professional engineer shall be physically present on-site during all aspects/phases of Section 01451, paragraphs 3.6, 3.7, and 3.8.** Shop drawings for the fire protection/detection system shall be prepared on full-size reproducible sheets. The shop drawings submitted for review shall be submitted on full-size prints. After updating all deviations, modifications, and changes, the final submittal shall be on reproducible sheets and CADD files (submitted on CD-ROM disk(s)); these will represent the final as-built drawings.

b. Asbestos and lead-based paint abatement submittals.

c. Color/finish sample boards submittals.

1.10.1.6 Certificates of Compliance

Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in the number of copies required by the above paragraph "Number of Copies." Each certificate shall be signed by an official authorized to certify in behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name

and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements.

1.10.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

a. Contractor-proposed deviations, including variations and other departures from the contract requirements, shall be noted/marked in red on each copy of the submittal data and shall be provided with a letter attachment to the ENG Form 4025 summarizing the proposed variation, deviation, or departure. Variations, deviations, or departures shall contain sufficient information to permit complete evaluation. Additional sheets may be used to fully explain why a variation, deviation, or departure is requested. At the minimum the information shall include:

- (1) An explanation in detail of the reason for the variation and how it differs from that specified;
- (2) The cost difference; and
- (3) How the variation will benefit the Government.

b. Any submittal annotated by a supplier or vendor with "Field Verify," "Select Color," or the like shall be accompanied by the Contractor's written response to the supplier's query.

1.11 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.12 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. One (1) copy of the submittal will be returned to the Contractor. The remainder will be retained by the Government. If the Government performs a conformance review of other Designer of Record approved submittals, the submittals will be so identified and returned, as described above.

1.13 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any

item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe. For design-build construction the Government will retain one copy of information only submittals.

1.14 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR
(Firm Name)
_____ Approved
_____ Approved with corrections as noted on submittal data and/or attached sheets(s).
SIGNATURE: _____
TITLE: _____
DATE: _____

For design-build construction, **both** the Contractor Quality Control System Manager and the Designer of Record shall stamp and sign to certify that the submittal meets contract requirements.

1.15 INSTRUCTIONS TO CONTRACTORS FOR TRANSMITTAL REQUIREMENTS

FORT WORTH DISTRICT

FOR INFORMATION ONLY (FIO) AND GOVERNMENT APPROVED (G) SUBMITTALS

1. General Requirements

a. General requirements for transmittal of FIO and G submittals is contained in the preceding specifications. Specific requirements on how to transmit FIO and G Submittals are outlined herein.

b. FIO and G submittal data shall be transmitted under separate ENG Form 4025s and assigned different Transmittal Numbers. If G and FIO submittal data is included in the same submittal, using the same ENG Form 4025, they will be considered an FIO submittal until the Contractor corrects the error.

c. The Contractor shall designate on each Eng Form 4025, above the Transmittal No., either FIO or G to show the transmittal type. This procedure allows ready identification of FIO or G submittals. The Government reserves the right to redesignate the category (G or FIO) of

submittals incorrectly identified by the Contractor.

d. The Contractor shall assure all FIO submittals for each technical section are submitted prior to or concurrent with the G submittals for that technical section. If appropriate FIO submittals have not been submitted, the G submittal will be returned disapproved.

e. Data transmitted with ENG Form 4025 shall be identified by marking it with the same item number(s) appearing in the "Item No." column on the form. The model number, part number, color, etc., of proposed materials or equipment shall be highlighted or otherwise identified.

f. The Contractor shall identify and include with each submittal a copy of any modification and/or Request for Information (RFI) or Government Correspondence that may have changed the requirements of the Contract in regards to each individual submittal.

2. Specific Requirements for For Information Only (FIO) Submittals

a. One fully coordinated FIO submittal shall be made for each technical section. Each FIO submittal listed on the ENG Form 4288, shall be submitted as a separate item on the ENG Form 4025 in the order they appear on the progress schedule. Technical data provided with the ENG Form 4025 shall conform to the "Submittals" paragraph in each Technical Section. (Example: SD-02 Shop Drawings as outlined herein.)

b. Items such as mill certificates or other test data unavailable until the equipment/material is manufactured/fabricated shall be identified on the initial ENG Form 4025. An explanation in the "Remarks" section shall explain this data will be submitted by Transmittal Number [] (fill in transmittal number) after materials are manufactured/fabricated (or other explanations as appropriate). A separate submittal for long lead time equipment or material may be made if sufficient data is furnished to show contract compliance. An explanation shall be provided in the "Remarks" section or on a separate sheet, if necessary, explaining why a partial submittal is being made. Explanation shall include the estimated delivery date of the above equipment/material and the Transmittal Number of the submittal that will contain data required by the particular specification section for the remaining equipment/materials. For contracts with several buildings/structures, separate transmittals for each technical section may be used if each building/structure is noted in the "Remarks" section of the ENG Form 4025. Samples of materials shall be submitted along with technical data, not under separate transmittals.

2.1 FIO Submittal Review

a. The Contractor's Quality Control (CQC) Representative has full responsibility for reviewing and certifying that all FIO submittal data and all equipment and/or materials comply with the contract. FIO Submittals are provided to the Government "For Information Purposes Only." Contracting Officer approval is not required and will not be given. The Government will not code any FIO submittals. Copies of FIO Submittals will not be returned to the Contractor.

b. However, the Government may perform QA reviews and re-reviews of FIO submittals at any time during the contract. If the Government determines submittal data is incomplete or not in compliance with contract, comments will be provided. Comments will state, "Disagree with Contractor's Certified Compliance" and list items not in compliance or not provided as required by the Contract. The Contractor shall respond to all comments by return FIO resubmittal on a new ENG Form 4025. Repeated incomplete or non-complying FIO submittals with improper certifications may result in disapproval of the Contractor's Quality Control (CQC) Program and/or possible replacement of the Contractor Quality Control (CQC) personnel.

c. Performance of, or failure to perform QA submittal reviews or Government requirement to submit additional data on FIO submittals, will not prevent the Contracting Officer from requiring removal and replacement of non-conforming material incorporated into the work. No adjustment for time or money will be allowed for corrections required because of non-compliance with contract plans and/or specifications.

3. Specific Requirements for Government (G) Approved Submittals

a. The Contractor's Quality Control Representative is responsible for assuring all data submitted is complete and in compliance with contract requirements. The Contractor shall assure all FIO submittals are submitted prior to or concurrent with the G submittal for each technical section. If the FIO submittals have not been submitted, the G submittal will be returned disapproved.

b. A separate submittal shall be made for each technical section with G submittals. FIO submittal data shall not be mixed with G submittal data.

c. The Government will provide written comments as appropriate and assign action codes to each item outlined on the back of the ENG Form 4025. One (1) stamped and dated copy of the submittal, along with any comments, will be provided to the Contractor. Action Code "A"- Approved As Submitted, and Code "B"- Approved Except As Noted, constitutes Government Approval. The Contractor shall resubmit under a separate Transmittal Number all data necessary to show compliance with Government comments on all other action codes.

d. Government review time, as stated in Paragraph 3.3 - Scheduling, is a minimum of ~~sixty (60)~~ **[AM #0002] fourteen (14)** calendar days unless otherwise specified. Government review time is exclusive of mailing time. Review time starts the day of receipt by the Government and continues until the day comments or notice of approval is provided the Contractor.

e. If the Contractor considers any Government review comment to constitute a change to the contract, notice shall be given promptly as required under the Contract Clause entitled "Changes." No request for "Equitable Adjustment" will be honored unless the Contractor complies fully with the prompt notice provisions of the contract.

4. Variations/Deviations/Departures from the Contract Drawings or Specifications

Contractor proposed variations, deviations, or departures from the contract drawings or specifications shall be noted in the "Variation" column of ENG Form 4025 with an asterisk, for each FIO submittal. A brief explanation, and the Transmittal Number of the appropriate "G" submittal (as explained below), shall be added to the "Remarks" section of the Form (or a separate sheet, if necessary). Each variation, deviation, or departure shall be listed as an item on a separate "G" submittal, which may contain other G submittal items. Variations, deviations, or departures will be processed and approved the same as G submittals, provided they are included in a G submittal. Variations, deviations, or departures will not be approved in the FIO submittal, and will be disapproved, until they are properly submitted on a "G" submittal. Variations, deviations, or departures shall contain sufficient information to permit complete evaluation. Additional sheets may be used to fully explain why a variation, deviation, or departure is requested. The Government reserves the right to disapprove or rescind inadvertent approval of submittals containing unnoted variations, deviations, or departures.

5. Submittal Numbering

Each submittal shall cover only one specification section. For purposes of consistency and to provide compatibility with the Government's computerized submittal register, submittal numbers shall include a specification section prefix and special suffixes. Note the following examples (for Technical Section 07416):

- a. New submittals - 07416-01, 07416-02, etc.
- b. Resubmittals -
 - (1) First resubmittal - 07416-01.01, 07416-02.01, etc.
 - (2) Second resubmittal - 07416-01.02, 07416-02.02, etc.
 - (3) Third resubmittal - 07416-01.03, 07416-02.03, etc.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
Ft Hood D-B Misc Const, Renovation, and Alteration Projects																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	DESCRIPTION	P A R A G R A P H	C L A S S I F I C A T I O N	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR	REMARKS	
						SUBMIT	BY	BY	A C T I O N C O D E	DATE OF ACTION	DATE RCD FROM CONTR	DATE FWD TO APPR AUTH/ TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	A C T I O N C O D E			DATE OF ACTION
(a)	(b)	(c)	ITEM SUBMITTED (d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01010	SD-02 Shop Drawings														
			Shop Drawings		G												
			SD-03 Product Data														
			Product Data														
			SD-04 Samples														
			SID and CID														
			SD-05 Design Data														
			Design Data														
			SD-06 Test Reports														
			Test Reports														
			SD-07 Certificates														
			Certificates														
			Asbestos-Free Construction														
			Material														
			Builders Hardware and Keying														
			Schedules														
			SD-09 Manufacturer' s Field														
			Reports														
			Field Reports														
			SD-10 Operation and Maintenance														
			Data														
			Operation and Maintenance Data														
		01011	SD-07 Certificates														
			Customer Service Inspection														
			Certification														

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A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	DESCRIPTION	P A R A G R A P H	C L A S S I F I C A T I O N S / C A R E I V E M E N T S	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR	REMARKS	
						SUBMIT (g)	BY (h)	MATERIAL NEEDED (i)	A C T I O N C O D E (j)	DATE OF ACTION (k)	DATE RCD FROM CONTR (l)	DATE FWD TO APPR AUTH/ (m)	DATE RCD FROM OTH REVIEWER (n)	A C T I O N C O D E (o)			DATE OF ACTION (p)
		01011	Sample Backflow Prevention Assembly Test & Maint. Report Certification of Natural Gas Heating Equipment														
		01012	SD-05 Design Data Design Development Submittals SD-11 Closeout Submittals Construction Documents	1.11.2													
		01016	SD-05 Design Data Design Data Checklists	1.13	G												
		01320F	SD-01 Preconstruction Submittals Network Diagram Reports		G RE G RE												
		01340	SD-04 Samples Color/Finish Sample Board(s)		G												
		01355	SD-01 Preconstruction Submittals Environmental Protection Plan (EPP) Storm Water Pollution Prevention Plan (SWPPP)		G												
			SD-02 Shop Drawings Hazardous Substance Reporting	3.18													
		01356A	SD-07 Certificates Mill Certificate or Affidavit	2.1.3													
		01368	SD-03 Product Data Casing Pipe	1.4.2													

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Ft Hood D-B Misc Const, Renovation, and Alteration Projects																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	DESCRIPTION	P A R A G R A P H	C L A S S I F I C A T I O N	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR	REMARKS	
						SUBMIT (g)	BY (h)	MATERIAL NEEDED (i)	A C T I O N C O D E (j)	DATE OF ACTION (k)	DATE RCD FROM CONTR (l)	DATE FWD TO APPR AUTH/ (m)	DATE RCD FROM OTH REVIEWER (n)	A C T I O N C O D E (o)			DATE OF ACTION (p)
		01368	Paint Usage and Material Safety Data Sheet (MSDS)		G												
			Data for HVAC Units														
			SD-04 Samples														
			Plastic Marking Tape and Tracer	1.4.1													
			Wire														
			SD-07 Certificates														
			Customer Service Inspections	1.6													
			Digging Permits	1.3													
			Fort Hood Airfield Use	1.2													
			Landfill Permit	1.5.1													
			Landfill Permit	3.1.1													
			Backflow Prevention Assembly														
			Tests														
			Certification of Natural Gas														
			Heating Equipment														
		01520	SD-03 Product Data														
			Government Field Office	2.1	G												
		01525	SD-01 Preconstruction Submittals														
			Accident Prevention Plan (APP)	1.8	G												
			Activity Hazard Analysis (AHA)	1.9	G												
			Crane Critical Lift Plan	1.8.1													
			Crane Work Plan	1.8.1													
			Proof of qualification	3.6.3													
			Supporting Systems	3.6.3													
			SD-02 Shop Drawings														

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A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	DESCRIPTION	P A R A G R A P H	C L A S S I F I C A T I O N	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR	REMARKS	
						SUBMIT (g)	BY (h)	BY (i)	A C T I O N C O D E	DATE OF ACTION (k)	DATE RCD FROM CONTR (l)	DATE FWD TO APPR AUTH/ (m)	DATE RCD FROM OTH REVIEWER (n)	A C T I O N C O D E			DATE OF ACTION (p)
		01525	Temporary Support Data	3.4.2	G												
			SD-06 Test Reports														
			Reports	1.13													
			Accident Reports	1.13.1													
			Monthly Exposure Reports	1.13.3													
			Regulatory Citations and	1.13.4													
			Violations														
			Crane Reports	1.13.5													
			Doctor's Reports	1.13.6													
		01561	SD-01 Preconstruction Submittals														
			Dust Control	3.1													
			Products and Procedures	2.1													
			SD-02 Shop Drawings														
			Recordkeeping	1.7													
		01670A	SD-11 Closeout Submittals														
			List of Recycled/Recovered	3.1													
			Materials														
		01720	SD-01 Preconstruction Submittals														
			Survey Data	3.1													
		01770F	SD-11 Closeout Submittals														
			Video Taping	1.5.1.1													
			Final Operations And	1.6.1													
			Maintenance Manuals														
			Preliminary Record Drawings	1.7.2													
			Final Record Drawings	1.7.4													
			Performance Bond	1.8.1													

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CONTRACT NO.

TITLE AND LOCATION Ft Hood D-B Misc Const, Renovation, and Alteration Projects						CONTRACTOR											
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	DESCRIPTION	P A R A G R A P H	C L A S S I F I C A T I O N S / C A R E T E R I O R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR	REMARKS	
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		01770F	Warranty Point of Contact	1.8.2													
			Warranty Report	1.8.5													
			Equipment Warranty Identification	1.9													
			Tags														
			Inventory Of Contractor Furnished	1.11													
			And Installed Equipment														
			Real Property Maintenance	1.13													
			Records														
		02220	SD-07 Certificates														
			Demolition plan	1.10	G												
			Notifications	1.4.1													
			Notification of Demolition and	1.4.1.2													
			Renovation forms														
			SD-11 Closeout Submittals														
			Receipts														
		02713A	SD-03 Product Data														
			Job-Mix Formula (JMF)	2.4.1													
			Waybills and delivery tickets	1.7													
			Sources of Aggregates	2.1.5													
			SD-04 Samples														
			Sources of Aggregates	2.1.5													
			SD-06 Test Reports														
			Sources of Aggregates	2.1.5													
			Bituminous Materials	2.2													
			Sampling and testing	1.4													
		02722A	SD-03 Product Data														

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CONTRACT NO.

TITLE AND LOCATION Ft Hood D-B Misc Const, Renovation, and Alteration Projects						CONTRACTOR											
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	DESCRIPTION	P A R A G R A P H	C L A S S I F I C A T I O N S I F I C A T I O N	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR	REMARKS	
						SUBMIT (g)	BY (h)	MATERIAL NEEDED (i)	A C T I O N C O D E (j)	DATE OF ACTION (k)	DATE RCD FROM CONTR (l)	DATE FWD TO APPR AUTH/ (m)	DATE RCD FROM OTH REVIEWER (n)	A C T I O N C O D E (o)			DATE OF ACTION (p)
(a)	(b)	(c)	ITEM SUBMITTED (d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02722A	Plant, Equipment, and Tools	1.7													
			Waybills and Delivery Tickets	3.1													
			SD-06 Test Reports														
			Sampling and testing	1.5	G												
			Field Density Tests	1.5.2.4	G												
		02741A	SD-03 Product Data														
			Contractor Quality Control	3.10	G												
			Material Acceptance and Percent	3.11													
			Payment														
			SD-04 Samples														
			Asphalt Cement Binder	2.2													
			Aggregates	2.1													
			SD-06 Test Reports														
			Aggregates	2.1													
			QC Monitoring	3.10,3.10													
			SD-07 Certificates														
			Asphalt Cement Binder	2.2													
			Testing Laboratory	3.6													
		02748A	SD-03 Product Data														
			Waybills and Delivery Tickets	1.3.3													
			SD-06 Test Reports														
			Sampling and Testing	3.7													
		02754A	SD-03 Product Data														
			Equipment	1.7													
			Paving	3.4													
			Mixture Proportions	2.11													

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CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
Ft Hood D-B Misc Const, Renovation, and Alteration Projects																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	D E S C R I P T I O N	P A R A G R A P H	C L A S S I F I C A T I O N	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				M A I L E D T O C O N T R A C T O R	R E M A R K S	
						S U B M I T	A P P R O V A L N E E D E D	M A T E R I A L N E E D E D	A C T I O N C O D E	D A T E O F A C T I O N	D A T E F R O M C O N T R	D A T E F R O M R E V I E W E R	D A T E F R O M O T H E R R E V I E W E R	D A T E O F A C T I O N			D A T E F R O M A P P R
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		13280A	SD-03 Product Data														
			Respiratory Protection Program	1.12	G												
			Cleanup and Disposal	3.11	G												
			Detailed Drawings		G												
			Materials and Equipment														
			Qualifications	1.5	G												
			Training Program	1.11													
			Medical Requirements	1.10													
			Encapsulants	2.1	G												
			SD-06 Test Reports														
			Exposure Assessment and Air	3.9	G												
			Monitoring														
			Local Exhaust Ventilation	1.20													
			Licenses, Permits and	1.14													
			Notifications														
			SD-07 Certificates														
			Vacuum, Filtration and Ventilation														
			Equipment														
		13282N	SD-01 Preconstruction Submittals														
			Occupational and Environmental	1.5.2.3	G												
			Assessment Data Report														
			Components Removal	1.5.2.2	G												
			Compliance Plan														
			Competent Person	1.5.1.1	G												
			Training Certification	1.5.1.2	G												
			Waste Management Plan	1.5.2.8													

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
Ft Hood D-B Misc Const, Renovation, and Alteration Projects																	
A C T I V I T Y N O	T R A N S M I T T A L N O	S P E C S E C T	DESCRIPTION	P A R A G R A P H	C L A S S I F I C A T I O N S / C A R T E R I O R S	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR	REMARKS	
						SUBMIT (g)	BY (h)	MATERIAL NEEDED (i)	A C T I O N C O D E (j)	DATE OF ACTION (k)	DATE RCD FROM CONTR (l)	DATE FWD TO APPR AUTH/ (m)	DATE RCD FROM OTH REVIEWER (n)	A C T I O N C O D E (o)			DATE OF ACTION (p)
(a)	(b)	(c)	ITEM SUBMITTED (d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		13282N	Fort Hood Sanitary Landfill approval														
			Medical Examinations	1.5.2.4													
			SD-06 Test Reports														
			Sampling results	1.5.2.3													
			Occupational and Environmental Assessment Data Report	1.5.2.3	G												
			SD-07 Certificates														
			Testing laboratory	1.5.1.3	G												
			Occupant Notification	3.1.1.1	G												
			Third party consultant qualifications	1.5.1.4	G												
			Clearance Certification	3.5.1.1	G												
			SD-11 Closeout Submittals														
			hazardous waste manifest		G												
			turn-in documents or weight tickets	3.5.2.1	G												
		13284F	SD-01 Preconstruction Submittals														
			Contractor's Qualifications	1.4	G												
			ODC Recovery and Recycling														
			Equipment's Certifications														
			Licenses and Permits	1.11	G												
			Notification of Recycling Activity														
			Spill Prevention Plan	1.7													
			Spill Prevention Plan	1.9													

CONTRACT NO.

Ft Hood D-B Misc Const, Renovation, and Alteration Projects

CONTRACTOR:
SCHEDULE DATES

CONTRACTOR ACTION	
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APPROVING AUTHORITY

MAILED
TO
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DATE RCD

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~~REMARKS~~
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ACTIVITY
NO

TRANSMITTAL NO

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DESCRIPTION

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APPROVAL

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TO APPR
AUTH/

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**ENVIRONMENTAL COMPLIANCE ACTIONS CHECKLIST
FOR
DESIGN
PROJECT MANAGEMENT ON FORT HOOD**

Created for Use by:

Plans and Projects Division

- ☐ Job Order Contract Division
- ☐ GSA-Government Supply Agency
- ☐ Indefinite Delivery Indefinite Quantity
- ☐ MCA- Military Construction
- ☐ Open End Contract Mechanisms

Services Division

Maintenance

Corps Of Engineers (COE)

Troop Construction

Directorate of Community Activities

Self Help Program

MEDDAC

Contract Operations (RCI)

Fort Hood Family Housing

Actus Lend Lease

All Star Maintenance

This checklist is to be used as “helpful hints” for project management on Fort Hood in terms of federal, state and local environmental compliance. This list does not serve to provide detailed description of required actions or regulatory interpretation. Further information can be found in referenced regulations (see table) and installation regulations such as **Fort Hood Regulation 200-1 Environmental Protection and Enhancement (to be published soon- meanwhile refer to 420-2)**. The full text of most federal and state environmental regulatory documents can be found using search engines on the World Wide Web. The Fort Hood Regulation 200-1 will soon be available on-line and hard copies will be available from the Environmental Division at Building 4219 at the cross streets of 77th and Warehouse Avenue. The checklist is a living document and may be subject to revision as regulations evolve so check the DPW Environmental website for revisions on a regular basis.

*This checklist may not include all potentially applicable environmental requirements for every new construction project or renovation project and **DOES NOT SUBSTITUTE** for submittal to the **FORT HOOD PROJECT REVIEW BOARD**. When you have questions or need assistance contact the appropriate program manager or individual listed below as associated with the compliance issue or media of concern.

Design				
Media/ Process	Required Action	Applicability Determination Criteria	Associated Submittals	Applicable Regulation(s)
All Environmental Media POC: Environmental Management 287-6499	NEPA Review/ Documentation	All new construction, demolition, renovation, building construction, leases, easements, permits, licenses, certificates and other entitlements for use.	Design/Work Plans to Project Review Board; REC, EA, or EIS (if necessary)	National Environmental Policy Act (NEPA); National Historic Preservation Act of 1966, As Amended in 2000; 32 CFR 651 (AR 200-2), AR 200-1, AR 200-3, AR 200-4
All Environmental Media POC: Spill & Emergency Resp. Coordinator 286-6262	Contingency Plan	All construction requires an emergency response plan to direct actions in the event of a fuel or hazardous substance release to the environment.	Include in Project Environmental Protection Plan(EPP)	30 TAC 327; FH Reg. 200-1 (Chap 3)

Energy POC: Utilities Engineer 287-1690	Metering	Metering is to be provided for all facilities and Project sites that will require utilities. The Fort Hood AMR spec. (automatic meter reading system spec) is to be included in the specification and drawing submittals. If you need a copy of these specs please call the Fort Hood Energy Office (287-1690)	Dwgs - Meter locations clearly identified. Specifications – to include AMR spec section as developed by Fort hood	FH 420-9; Executive Order (E.O.)13123
Energy POC: Utilities Engineer 287-1690	FM System connection	3 ton and higher condensing units, chillers, and other large load HVAC equipment to be considered for FM system management. (Frequency Load Management system spec) to be included on specification submittals. If you need a copy of these specs please call the Fort Hood Energy Office (287-1690).	Dwgs – indicate HVAC equipment and exterior lighting systems to be tied into FM system. Specifications – to include FM spec section as developed by Fort hood	FH 420-9; Executive Order (E.O.) 13123

Design (continued)				
Media/ Process	Required Action	Applicability Determination Criteria	Associated Submittals	Applicable Regulation(s)
Energy POC: Utilities Engineer 287-1690	Construction Methods & Equipment Submittal Review	All new construction must be reviewed for energy savings opportunities. Government agencies are required to reduce their greenhouse gas emissions attributed to facility energy use by 30 percent by 2010 compared to such emissions levels in 1990.	Facility/ Infrastructure/ equipment drawings and specifications must be submitted for review.	FH 420-9; Executive Order (E.O.) 13123; 4 Feb 2003 Memorandum for Sustainable Design and Development; 18 March 2003 Memorandum for Sustainable Design and Development Requirements
Soil POC: Cultural Resources Management 287-1092	Excavation Permit	All construction activities that requires disturbance or excavation of soil. An Installation Digging Permit must be obtained and approved by all signatories before construction commences	Coordination for Land Excavation Form FTH200-1	National Historic Preservation Act of 1966, As Amended in 2000; Archeological Resource Preservation Act of 1979; FH Reg. 200-1
Waste Management POC: Waste Program Manager 287-9184	Waste Management Plan	All Construction. A waste management/ recycling plan that includes regulatory and installation policy compliance must be complete BEFORE construction commences.	COE: Non-hazardous solid waste disposal plan; recycling and solid waste minimization plan RCI: Demolition Plan (EEP-6); Soil Remediation Work plan (EPP-3) Submit to ENV for review	All: Executive Order 13101; 30 TAC 328; 30 TAC 330; 30 TAC 332; FH Reg. 200-1 (Chap. 4 & 11); FH Reg. 420-6; COE: Corps Guide Specs 01355, 01368, 01572 & 02220; RCI: 1. Municipal Services & Utility Support Agreement, section 3.4 2. Environmental Protection Plan, Government Contract No. DACA02-C- 0001

Design (continued)				
Media/ Process	Required Action	Applicability Determination Criteria	Associated Submittals	Applicable Regulation(s)
Disposal: Soil Remediation POC: Soil Bioremediation Program Manager 287-9184	Waste Management Plan	All construction & demolition activities that produce inert material.	COE: Non-hazardous solid waste disposal plan RCI: Soil Remediation Work plan (EPP-3) Submit to ENV for review	All: Executive Order 13101; 30 TAC 328; FH Reg. 200-1 (Chap. 4 & 11); COE: Corps Guide Specs 01355 & 01368; RCI: 1. Municipal Services & Utility Support Agreement, section 3.4 2. Environmental Protection Plan, Government Contract No. DACA02-C-0001
Disposal: Inert Material POC: Waste Program Manager 287-9184	Waste Management Plan	All construction & demolition activities that produce inert material such as concrete.	COE: Recycling and solid waste minimization plan. RCI: Demolition Plan (EEP-6); Soil Remediation Work plan (EPP-3) Submit to ENV for review	Executive Order 13101; 30 TAC 328; FH Reg. 200-1 (Chap. 5); COE: Corps Guide Spec 01355, section 1.7 para K & L; Corps Guide Spec 01368; RCI: 1. Municipal Services & Utility Support Agreement, section 3.4 2. Environmental Protection Plan, Government Contract No. DACA02-C-0001. Appendix A, EPP-22.

Design (continued)				
Media/ Process	Required Action	Applicability Determination Criteria	Associated Submittals	Applicable Regulation(s)
Air POC: Air Program Manager 287-8714 or 288- 5284	Meet TCEQ Nitrogen Oxide limits	All construction that includes installation of natural gas fired water heaters, boilers, and process heaters with a max rated capacity of 2.0 million British Thermal Units per hour (MM Btu/hr) or less.	Keep Manufacturer's Information that demonstrates limit compliance in project file.	30 TAC Part 1, Chapter 117, Subchapter D, Division 1, Rule 117.465
Asbestos POC: Asbestos Program Manager 288-5132	MSDS and signed statement identifying asbestos containing materials.	All construction building products. Asbestos containing products forbidden unless there is no alternative material available. Requires signed statement from an architect, engineer or Texas Department of Health(TDH) Inspector accompany the MSDS in file that identifies presence or absence or asbestos.	Describe Submittal Process in EPP/ Work Plan Statement and MSDS to project file.	TX House Bill 1927 (Effective 9/01)
Air POC: Air Program Manager 287-8714 or 288- 5284	Meet new and modified storage tank design criteria	Any storage tank installed after 22 Dec 1998 which is required to install Stage I control equipment and any modification to a storage tank existing prior to 22 Dec 1998	Must be equipped with a non-coaxial Stage I connection	30 TAC Part 1, Chapter 115, Subchapter C, Division 2, Rule 115.222
Air POC: Air Program Manager 287-8714 or 288- 5284	Standard Permit/Permit by Rule/Title V Operating Permit Revision	Any new facility or modification to an existing facility that may emit contaminants (Hazardous Air Pollutants or Texas Contaminants) to the air must obtain a permit or satisfy conditions for a permit by rule. (Contact DPW-ENV for instruction)	Permit Application or Revision to TCEQ and/or EPA and DPW-ENV	30 TAC Subchapter B, Division 1, Rule 116.110(a); 30 TAC Part 1 Subchapter A, Rule 106.4; 30 TAC Subchapter C, Division 2, Rule 122.210; FH 200-1 (Chap 6)
Surface Water POC: Water Program Manager 287-8712	Permit to Divert or Use Surface Water	All construction or other work that will require the storage, taking, or diversion of surface water, not including potable water. Check with DPW- ENV first to see if FH already has a permit for your location.	Submit the Temporary Water Use Permit to TCEQ & copy to ENV. Submit monthly reports of total surface water use to ENV.	Texas Water Code (Chap 11); FH 200-1 (Chap 2)

Design (continued)				
Media/ Process	Required Action	Applicability Determination Criteria	Associated Submittals	Applicable Regulation(s)
Surface Water POC: Natural Resources Management Team 287-2885	Coordinate with ENV and/ or Fort Worth COE for wetland determination	All activities impacting surface water or drainage features whether or not currently wet.	Detailed description of type of activity and boundaries of area impacted to ENV	Clean Water Act; FH 200-1 (Chap. 9)
Wastewater POC: Water Program Manager 287-8712	Coordinate wastewater discharges with ENV	With some exceptions, most wastewaters require a permit prior to discharge to the environment (e.g., superchlorinated water, or vehicle wash water). Contact ENV with any questions about specific wastewater discharges.	Include in project EPP or SWPPP and submit to ENV for review.	Clean Water Act; TX Water Code;
Environmental Management System POC:EMS Program Manager 288-5256	Environmental Compliance Commitments	Required for all new construction	Submit Environmental Policy in scope of work.	ISO 14001
New Construction POC: Sustainability Program Manager 286-6664	Sustainability Specifications	All new construction must rank at SPiRiT silver level up to fiscal year 2005. Fiscal year 2006 all projects must meet SPiRiT level gold ranking. The checklist can be found at either http://www.cecer.army.mil/SustDesign/SPiRiT.cfm or on the G drive at G:\ENV\SPiRiT	Include SPiRiT design checklist in scope of work	4 Feb 2003 Memorandum for Sustainable Design and Development; 18 March 2003 Memorandum for Sustainable Design and Development Requirements

Design (continued)				
Media/ Process	Required Action	Applicability Determination Criteria	Associated Submittals	Applicable Regulation(s)
Landscaping: POC: Natural Resources Management Team 287-2885	Sustainability Specifications	All construction and demolition activities requiring removal of trees and shrubs as well as new plantings must follow Landscaping Guidelines.	Submit plan to Environmental and Natural Resources for review.	AR 200-1; FH 420-27; Memorandum of Instruction (MOI) – Landscaping Unit Areas

Created by the Environmental Project Review Team:

Environmental Division Project Review Personnel:

ENVIRONMENTAL DIVISION				BLDG 4219
			NEXTEL Cell #	NEXTEL Radio #
Burrow, Steve	Chief, Environmental Programs	287-6499	535-2625 6	Victor 1
Niemann, Nancy	Chief, Environmental Division	287-6499	535-3069 226	Victor 4
Joseph, Robert, MSG	SGM, Environmental Division	287-7248	535-6235 262	Victor 20
Jackson, Kathy	Management Assistant	287-6499		
Fax	Environmental Division Office	287-3591		
CULTURAL RESOURCES MANAGEMENT TEAM				BLDG 1938
Huckerby, Cheryl	Chief Archeologist	287-1092	535-6239 264	
Kleinbach, Karl	Senior Field Archeologist	288-0427	535-6243 266	Victor 6
Wenzel, Kristen	Field Archeologist/Public Outreach	287-2633	535-6247 267	Victor 6 Alpha
Wood, Sunny	ORISE Archeologist	287-6199		Victor 6 Charlie
Smith, Gavin	Curator	288-0846		Victor 6 Echo
Glinn, Dennis	ORISE Archeologist	287-7965		Victor 6 Delta
New Employee	Research Assistant			
ENERGY MANAGEMENT TEAM				BLDG 4219
Lynn, Bobby	Utilities Sales	287-8716	535-6233 261	Victor 2
Vesey, Jerry	Utilities Engineer	287-1690		Victor 23
Piotrowski, Frank	Utilities/Electrical Engineer	618-8003		
Cook, Myron	Utilities	287-7283	535-3051 260	Victor 22 Alpha
Shaff, Daniel	Conservation	287-7283	535-6231 217	Victor 22
ENVIRONMENTAL MANAGEMENT BRANCH				BLDG 4219

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Perez, Miguel	Chief	287-8713	535-3053 218	Victor 10
Allen, Wes	CU / Recycle Operations	287-1063/288-7627		
Andersen, Don	Bio-Remediation / Spill Response	286-5993		Victor 17 Alpha
Anderson, Fred	Tank Truck Driver/ Interceptors	288-7627		Victor 17 Bravo
Avila (Keaton), Tanicha	HSMS Data Entry Clerk	288-5262		
Basile, Jeffrey	Installation Sustainability Program	286-6664		Victor 26
Bump, Vicki	NEPA	288-5462		
Clark, Mike	HSMS Administrative Manager	287-8711	535-6255 271	
Cook, Joanie	Air Quality Program	288-5284	535-6329 307	Victor 14 Alpha
Coffman, TC	Tank Truck Driver (Oil Pod's)	288-7627		Victor 25
Davis, Charmaine	Env Compl Assessment Team (ECAT)	287-9103	535-6225 258	Victor 28
Doeringsfeld, Julie	Environmental Management Systems	288-5256		
Doyle, Randy	P2/Contracting/Sustainability/EMS/ECAT	287-1099	535-3059 221	Victor 8
Dutchuk, Timi	EPCRA/HAZMAT/HSMS/Training	287-9718	535-6223 257	
Frederick, Dale	Env Compl Assessment Team (ECAT)	287-9604	535-6241 265	
Garcia, Art	Parts Washers/Solvent Recycling	288-5264	535-2335 4*12924	Victor 8 Bravo
Gilmore, Greg	Tank Truck Driver (Fuel and Antifreeze Pod's)	288-7627		Victor 19
Goodman, Gary	Drinking Water Program	287-4256		
Gregor-Persley, Alyssa	CU / Admin Support / HSMS / STEERS	288-7627		Victor 9
Hughes, Amber	Bio-Site / Admin Support	286-5993		Victor 17 Charlie
Johnson, Clarence	HAZMART Bldg. #4406	285-6548		
Kachura, Alex	Asbestos / EPCRA / HSMS	288-5132	535-3065 224	Victor 7
Kennedy, Robert	ODC / PCBs / Air Quality / Noise	287-8714	535-6219 255	Victor 14
Kimball, Stoney	CU / Support / Sampling	287-1063/288-7627		Victor 9 Alpha
Mayes, Ed	Bio-Remediation / Spill Response	286-5993	535-3061 222	Victor 12
McGaha, Leslie	Environmental Training Coordinator	287-8755		Victor 27
Michna, Valorie	Storm Water Program	618-8888		Victor 30
Mills, Al	Bio-Site/PCB/HR Inventories/Spills/Washrack	286-5993	535-3055 219	Victor 17
Mullen, Carter	Pollution Prevention	287-9734		
Pintor, Stacy	Municipal Storm Water Program	287-9812		
Priest, Charlotte	Spill & Emerg Resp/PSTs/SPCC/Fuels Mgmt	286-6262	535-6227 259	Victor 5
Ropati, Melanie	Env Compl Assessment Team (ECAT)	287-9105	535-6309 297	
Salmon, Jeff	Restor/Remed/Biosite/SW/RCRA-D/DSERTS/SWARS	287-9184	535-6221 256	
Silva, Emely	Energy-Utilities / ECAS / EPR / EQR / ISR	287-7671		
Smart, Dan	Env Compl Assessment Team (ECAT)	287-9604	535-3029 206	Victor 29
Tooke, Gary	CU Mgr/Spills/Oil/Fuel/Antifreeze Reclam.	288-7627	535-2339 4*12927	Victor 13
Walker, Rufus	CU / Support / Sampling	287-1063/288-7627		
Webster, Don	Bio-Remediation / Spill Response	286-5993	535-3063 223	Victor 12 Alpha
White, Keith	Parts Washers/Solvent Recycling	288-5264	535-6237 263	Victor 8 Alpha
Young, Riki	Drinking/Waste/Storm Water	287-8712	535-3067 225	Victor 3
New Employee	NEPA-Bldg 4612	287-3305		
Fax	CU, Bldg1348	287-6998		
Fax	Environmental Management Branch	287-2718		
NATURAL RESOURCES MANAGEMENT BRANCH				BLDG 1939
Herbert, Dennis	Chief	287-0310	535-3031 207	Whiskey 6
Windham, Carolyn	Administrative Assistant	287-2885	535-6273 279	Whiskey 1
Buchanan, Tim	Soil Conservationist	287-3114	535-3035 209	Whiskey 3
Cagle, Kevin	Fisheries	287-2349	535-3039 211	Whiskey 5
Cornelius, John	Endangered Species	287-1088	535-3037 210	Whiskey 4

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Eckrich, Gil	Natural Resource Outreach Coordinator	286-5942	535-3045 214	Whiskey 9
Esseltine, John	Heavy Equipment Operator	287-1090	535-3047 215	Whiskey 10
Hamilton, Anne	Entomologist	288-5030	535-3041 212	Whiskey 7
Jones, B.R.	Wildlife	287-0311	535-3033 208	Whiskey 2
Pekins, Charles	Wildlife	286-5941	535-6249 268	Whiskey 11
Sanchez, Laura	Agronomy/Digging Permits	288-3211	535-6265 275	Whiskey 8
Taylor, Bobby	Heavy Equipment Operator	287-1090	535-6281 283	Whiskey 12
Fax	Bldg 1939	288-5039		
RECYCLE BUSINESS OFFICE				BLDG 4219
Turnquist, JayCee	Business Manager	287-2336/288-5307		Oscar 31
Aaron, Patricia	Administrative Assistant	287-2336		
Born, Derrick	Sales	287-1606		
RECYCLE PROCESSING CENTER				BLDG 4621
Farris, Charles	Recycle Operations Coordinator	287-6732 / 287-7881		Oscar 30
	M / I / S / Supervisor	287-6732 / 287-7881		Victor 24
Fax	Bldg 4621	287-6409		
RECYCLE COLLECTION PROGRAM				BLDG 4621
Ruff, Gary	Recycle Collection Supervisor	287-6732		Victor 31
Kachura, Alex M., Sr.	Driver	287-6732		Victor 32
Dale, James C.	Driver	287-6732		Victor 33
Hair, Edith E.	Driver	287-6732		Victor 34
Nelson, Margo D.	Driver	287-6732		Victor 35
	Driver	287-6732		Victor 36
	Driver	287-6732		Victor 37

DSN: 287 = 737
288 = 738

References:

32 CFR 651
AR 200-1
AR 200-3
FH Reg 200-1

<h2 style="text-align: center;">ENV Standard Operating Procedure</h2> <p style="text-align: center;">Code x.x Environmental Department</p>			
Document No: ENV-SOP-IMMU	Revision: Supersedes: Initial Publication	Prepared By: Jeff Salmon Solid Waste PM	Approved By: Jeff Salmon Solid Waste PM
File Name: IMMUSOP		Effective Date: 29 Mar 2004	Number of pages: 6

Title: Use of Fort Hood's Inert Material Management Unit (IMMU) (also known as "the rubble pile")

1.0 PURPOSE

Process required for use of IMMU.

2.0 APPLICATION

Applies to any division or agency using the IMMU.

3.0 REFERENCES

- a. Fort Hood's Integrated Solid Waste Management Plan
- b. 30 TAC 328 – Waste Minimization and Recycling
- c. Residential Communities Initiative (RCI) Environmental Plan
- d. Corps of Engineer (COE) Guide Specification 01368 and 01355A

4.0 DEFINITIONS

- Objectives:**
1. Ensure that only inert material is deposited at the IMMU.
 2. Track by weight and segregation all materials deposited at the IMMU.

Initiative: Material going to the IMMU must be segregated, documented and weighed.

- Action:**
1. Clean fill must be separated from rock & concrete aggregate, which must be separated from asphalt, etc.
 2. Rebar can extend no more than 6" beyond concrete.
 3. C&D Disposal Logs will be issued by the project COR. Each vehicle will have a C&D disposal logs. Multiple entries are allowed on a log. Log is a Word file and can be produced as needed. Project COR issues C&D disposal log to each vehicle going to the IMMU. The log is completed for each load going to the IMMU: (see attached spreadsheet)
 - a. COR completes: Contract # and Contractor block.
 - b. Vehicle driver completes: Vehicle #, date, description of debris, bldg # and driver blocks.

- c. Landfill scale operator completes: weight and receiver blocks.

Measure: All loads going to the IMMU must be weighed and documented. C&D disposal logs are to be turned into the Environmental Office (Attn: Solid Waste Program Manager) at the end of the project, unless requested earlier.

Target: 30 TAC 328 requires all loads deposited at the IMMU must be weighed, inspected, and documented. The amount diverted from the landfill to the IMMU will be determined from the information on the C&D disposal log.

Program Area: Integrated Solid Waste Management Plan

5.0 PROCESS JUSTIFICATION

- a. This process is mandated by:
 - 1. Notice of Violation (NOV) issued by the Texas Commission on Environmental Quality (TCEQ) dated 21 August 2003.
 - 2. Department of Defense (DOD) Measure of Merit (MoM) (this should be included in your references) mandating 40% solid waste diversion rate.
- b. Processing all C&D loads through the landfill scale will allow Fort Hood to monitor and measure the quality and quantity of material being deposited at the IMMU and the amount of material reused from the IMMU stockpiles.

6.0 PROCESS STEPS

STEP 1: Access to the IMMU is limited to Fort Hood's Municipal Solid Waste (MSW) Landfill hours of operation. Currently, landfill is open 7:30am to 4:30 pm (0730 – 1630) Monday thru Friday, and 7:30 am to 1:30 pm (0730- 1330) on Saturday. Special hours of operation can be arranged for large or emergency situations by contacting the Solid Waste Program Manager, 287-6499.

STEP 2: All loads going to the IMMU must be segregated into the following categories: clean fill, rock and concrete (no more than 6" exposed re-bar), asphalt pavement, sand, sod, clean masonry and brick must be in separate loads.

STEP 3: All loads going to the IMMU must be weighed and inspected at the MSW landfill scales.

STEP 4: All loads going to the IMMU must be documented on a C&D disposal log. Project CORs will have C&D disposal logs issued to each vehicle.

STEP 5: The IMMU is segregated by material. If site attendant is not available, consult site map for material location. Site maps are available through the Environmental Office, Solid Waste Program Manager, 287-6499.

STEP 6: All C&D disposal logs are to be turned into the Environmental Office upon completion of the project, unless requested earlier.

STEP 7: Upon the direction by the DPW Environmental Office or the DPW Maintenance Division Office inert loads may be diverted to alternate locations. These locations will be within contract mileage limitations. CORs will be given adequate time to adjust routes.

STEP 8: Inclement weather schedule. During periods of rain, material will not be accepted at the IMMU. For information concerning the operation of the IMMU during rainfall events call:

Monday thru Friday: 1) Call Site Attendant (254.535.6361)

2) Alternate Larry Pohlmann (254.535.2676).

Saturdays: The IMMU will be closed.

STEP 9: This process will remain in effect until 30 Jun 2004, unless otherwise directed. At which time the process will be evaluated.

7.0 MANAGEMENT REVIEW

AUTHORITY. The Fort Hood Solid Waste Program Manager is responsible for this process and reviews and approves all changes or modifications.

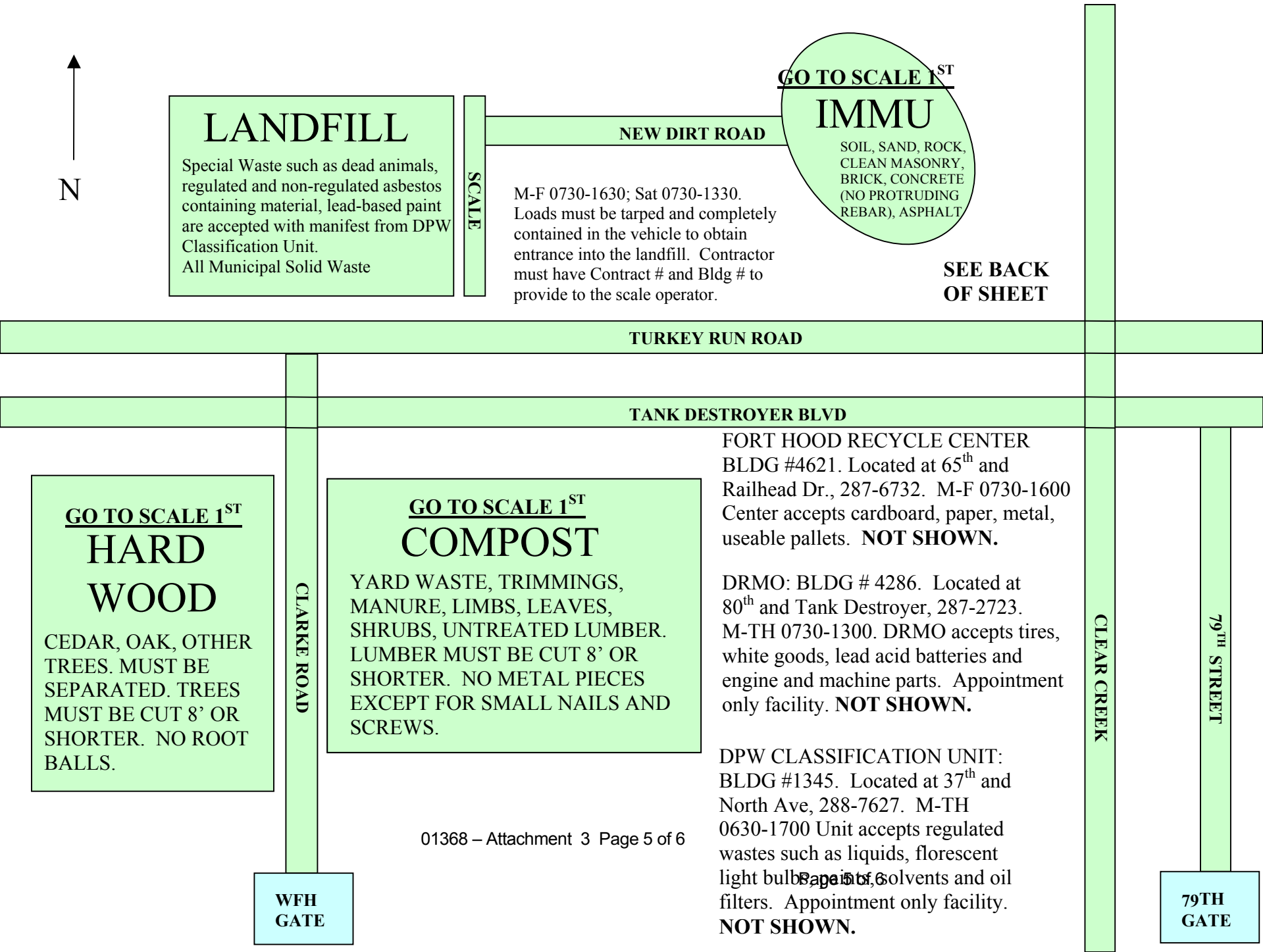
C&D DISPOSAL LOG

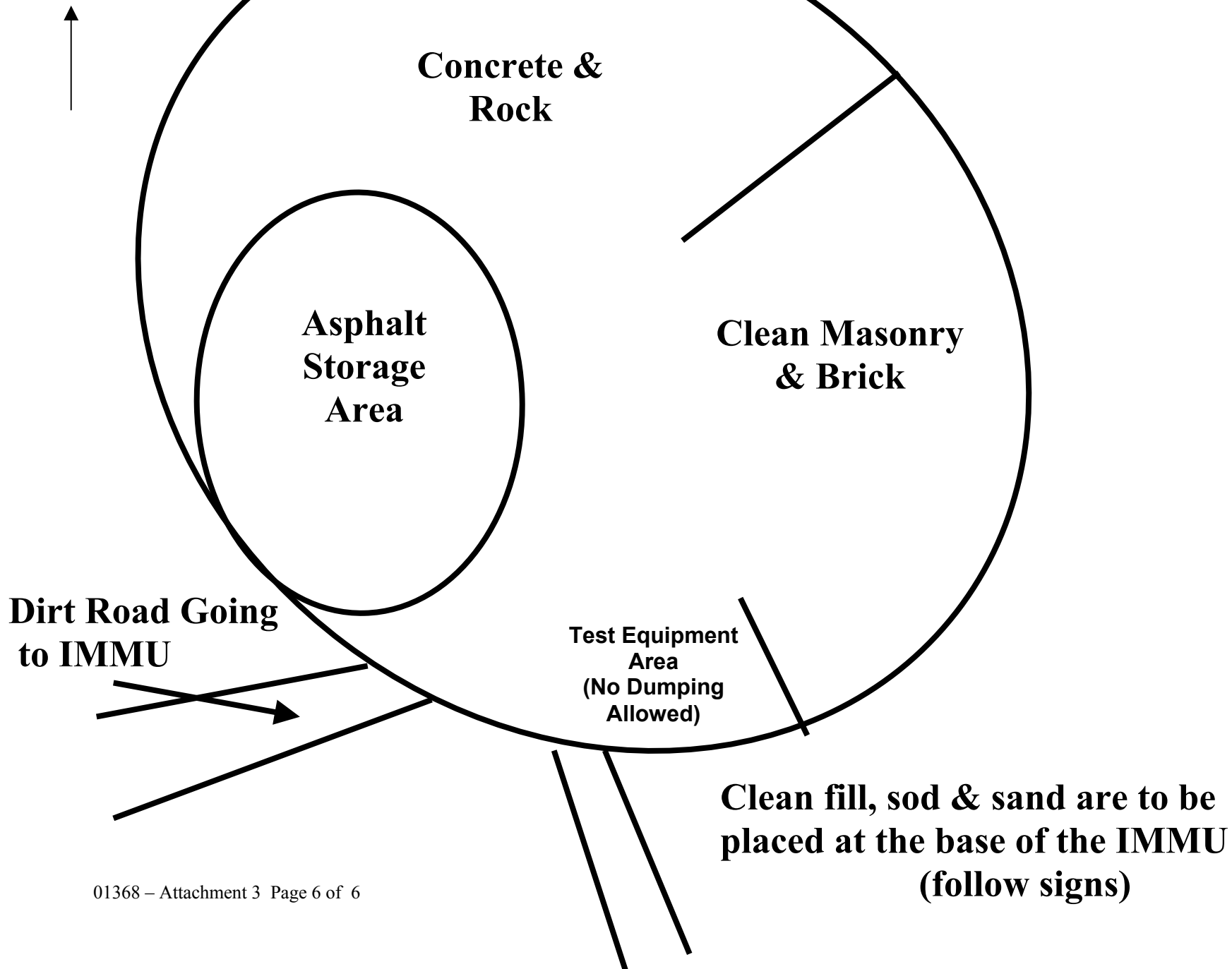
1. Contract # _____

2. Contractor _____

3. Vehicle # _____

[illegible]





SECTION 01421

BASIC STORM WATER POLLUTION PREVENTION PLAN
AMENDEMNT NO. 0002

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 110	Protection of Environment: Subchapter D--WATER PROGRAMS, Discharge of Oil
40 CFR 122	EPA Administered Permit Programs: The National Pollutant Discharge Elimination System
40 CFR 123	State Program Requirements: The National Pollutant Discharge Elimination System

FEDERAL REGISTER (FR)

63 FR 128	(6 July 1998) Water Pollution; Discharge of Pollutants (NPDES): Storm Water Discharges - Construction Activity; General Permits, 36490-36519
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1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in the initial design submittals required after contract award.

Storm Water Pollution Prevention Plan; G

1.3 SUMMARY

This Section provides a Basic Storm Water Pollution Prevention Plan (SWPPP) that meets the Texas Pollutant Discharge Elimination System (TPDES). Both the Government and the Contractor meets the definitions as operators for the construction activities. The Government has control over the construction plans and specifications. The Contractor has day-to-day control of field activities to ensure compliance with storm water construction permit. The environmental project designer shall prepare a Contractor operation SWPPP. The Contractor shall prepare a field and operation specific SWPPP that meets the requirements in the TPDES General Permit and this section.

<http://www.tnrc.state.tx.us/permitting/waterperm/wwperm/tpdestorm.html>
(PERMIT NO. TXR 150000 for large or small construction site)

The SWPPP shall include both the narrative and drawings of those sites, if the site is equal to or greater than one (1) acre of disturbed area. The Notice of Intent (NOI) for the Storm Water Discharge Permit shall only require for sites that are equal to or larger than five (5) acres of disturbed area. The NOI shall be filed 48 hours prior to soil disturbance. **AM #0002 TCEQ may require separate NOI and NOT for each separate site.** The storm water control structures shall be placed at the perimeter downslope of the construction site and at the existing storm grates regardless of the size of the disturbed site.

The SWPPP narrative shall describe at least the following: description of project and construction activities, potential pollutants and sources, pollution control measures (both structural and non-structural), best management practices (BMP), schedule or sequence of major construction activities, temporary and permanent stabilization methods at disturbed areas, requirements for notifications (i.e. NOI, NOT, MS4), and necessary ATTACHMENTS (PART 12) to track storm water pollution prevention tasks at job site. The SWPPP drawings shall include project location vicinity map, site map indicating drainage patterns, approximate slopes anticipated at the finished site, limits of clearing and grubbing, areas of soil disturbance, and areas not to be disturbed, site drainage features (existing or new wetlands and drainage swales), surface water flow direction, locations and types of structural and non-structural storm water control devices, areas to receive stabilization practices, legend and site direction indicating north arrow, and construction detail drawing of each structural control device. The SWPPP prepared by the Contractor shall be submitted to the Government for approval, at the initial design after contract award, prior to submittal of NOI to the regulatory agency. There is no separate payment for work required in this section.

1.3.1 Editable Copy

An editable version of this Section is located on the Contract award CD-ROM disk. It is in the Corps of Engineers' Specsintact software format.

1.4 PROJECT IDENTIFICATION

PROJECT TITLE: See Request For Proposal

LOCATION: FORT HOOD, TEXAS

1.5 PROJECT DESCRIPTION

The general scope of this project includes construction of hard stands, pavement repair, and renovation of building interior. Supporting facilities that include utilities, i.e. water, sanitary sewer, gas, electric service, storm drainage, lighting, fire protection, etc. The Contractor shall evaluate the RFP to verify the project requirement that will impact design of storm water pollution prevention plan and determine the total project site area.

1.6 BID OPTIONS AND PROJECT PHASING

There are no Bid Options for this project.

1.7 STANDARD INDUSTRIAL CLASSIFICATION (SIC)

1771 - Concrete Work (includes asphalt, i.e. access drives and parking lots, culvert construction)

9711 - National Security (a general category for military facilities)

1.8 LOCATION

The project (AM #0002) sites are ~~site is in~~ Fort Hood, Coryell AM #0002 or Bell County. The various sites are located at the main cantonement area. [NOTE: The Contractor shall address the latitude, longitude and the physical boundary of each site that are required to cover by this Storm Water P3 as described in paragraph 1.3 SUMMARY, this section.]

1.9 RECEIVING WATERS

The proposed sites are in the Brazos River watershed. Surface runoff from the sites are collected by surface grates or drainage swales to Nolan Creek and Clear Creek that feeds into the Belton Lake. [NOTE: The Contractor shall verify the receiving creeks from various sites.]

PART 2 SITE DESCRIPTION

2.1 EXISTING CONDITIONS

[NOTE: The Contractor shall describe the existing site drainage patterns, conditions, and design storm frequency for runoff volume calculation. No unusual site drainage is observed during preparation of this document.]

2.2 FUTURE CONDITIONS

[NOTES: The contractor shall describe the site conditions which will exist upon the completion of construction activities. Include estimates of future runoff coefficients. Concentrate on features which affect storm water volume and drainage.]

2.3 CONSTRUCTION ACTIVITIES

NOTES: The SWPPP shall state the project start and completion dates, describe the sequence of MAJOR construction activities, and record dates of stabilization. The following list of activities is for reference and a project specific list shall be prepared.

1. Major Construction Activities at New Facility Site

A. Clearing and Grubbing - (NOTE: The SWPPP designer shall discuss limit of clearing and grubbing or indicate that it has been delineated on the SWPPP drawing. If possible, preserve the existing vegetation to minimize soil erosion.)

B. Grading, Construct Site Drainage Features and Utilities - (NOTE: The SWPPP designer shall discuss grading for positive removal of most storm water from site via sheet flow into the new trench drain, sidewalk drains and curb gaps, and eventually empties into the existing storm drainage system.)

C. Construction Flatwork & Phasing- (NOTE: The SWPPP designer shall discuss the activities on construction bid options)

and phasing.)

D. Site Stabilization - (NOTE: The SWPPP designer shall discuss methods for temporary and permanent stabilization and record date of temporary or permanent stabilization as stipulated by the Storm Water Discharge General Permit.)

2. Major Construction Activities for Demolition Site

A. Removal, Recycling, or Disposal of regulated materials prior to demolition. (NOTE: The SWPPP shall discuss the regulated materials and their sequence of removal and disposal in this project.)

B. Demolition - (NOTE: The SWPPP designer shall discuss all demolition needed for site, electrical, mechanical, environmental, etc.)

C. Grading and Drainage - (NOTE: The SWPPP designer shall discuss restoration to existing grade and drainage pattern.)

D. Site Stabilization - (NOTE: The SWPPP designer shall discuss method used for permanent stabilization.)

The Contractor shall establish storm water control structures prior to conducting any site disturbing activities (i.e. site abatement, demolition, etc.). Then subsequent construction activities include clearing, grubbing, grading, constructing site drainage devices and utilities, foundation, and paving. The Contractor shall maintain temporary and permanent site stabilization at each portion of site in accordance with Section 3.0 EROSION AND SEDIMENT CONTROLS. It is a Federal and state requirement that the Contractor shall record date of these major construction site activities and dates of stabilization (see paragraph ATTACHMENTS). Storm water control structures shall not be removed after final stabilization and approval of the COR. Final stabilization is established at the disturbed site when all soil disturbing activities at the site have been completed and a uniform perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or other stabilization measures (such as riprap, gabions, or geotextile). The Storm Water Discharge General Permit stipulates record-keeping of start dates of major construction activities (i.e. clearing and grubbing, grading, trenching and excavation, dirt moving, etc.) and dates when construction activities temporarily or permanently cease on a portion of the site, and the start date of stabilization.

Construction of this project will start October 1, 2004 and will be completed on March 2005. [NOTE: The Contractor operation specific SWPPP shall verify the total project start and completion date.]

2.4 SOILS DATA

The following soils data are from Soil Survey of Coryell County, Texas, issued March 1977 by the United States Department of Agriculture, Soil Conservation Service. This site contains one soil type. The Topsey-Urban land complex association is characterized by deep and gently sloping land with slopes ranging from 3 to 8 percent, with an average of 4 percent. Typically, the surface layer is dark grayish brown clay loam and is

approximately 7 inches deep. The subsoil measures approximately 22 inches and is grayish brown clay loam containing calcium carbonate concentrations and shale fragments. The underlying material consists of stratified layers of marl and shale. This soil type is generally well drained, however, permeability is moderately slow and occurs at the rate of 0.6 to 2.0 inches/hour. Availability of water is medium. Runoff is medium to rapid, and erosion hazard is severe. The root zone is easily penetrated by plant roots. Unified Soil Classification of this soil type is C. Potential for shrink-swell is moderate. Soil reaction (pH) ranges from 7.9 to 8.4. There is no known contamination in the storm water from both sites.

2.5 STORM WATER POLLUTION PREVENTION DRAWINGS

NOTE: Identify drawing sheet number, and title of sheet. Also attach a copy of each referenced sheet when submitting the SWPPP for Government review.

The site map or maps should be clear enough to interpret the following: Drainage patterns; appropriate slopes after major grading; show limit of soil disturbance area and perimeter control (in most cases, it is the same as grading limits or construction right-of-way); outline of areas not to be disturbed during construction (i.e. vegetative buffer zones, cultural resources, wetlands, and area of environmental concern); locations of both existing and new storm water control devices at inlet protections, and along drainage ways leaving from the site; locations of major structural and non-structural storm water controls (planned or existing); areas where temporary stabilization practices are expected to occur; surface water (including wetlands) locations (NOTE: If the site is not adjacent to surface water, indicate the general direction of flow to the nearest surface water with a "directional arrow" on grading map; identify the name of water way as lake, stream, creek, river, unnamed tributary of named receiving stream, etc.); site storm water discharge locations and outfall protection devices; construction details of storm water structural controls. If permanent stabilization includes establishment of turf, indicate or describe the area to be stabilized by turf (or other method). Show locations for off-site material, clean dirt disposal, borrow, fill areas and the necessary storm water control devices on the PROJECT LOCATION AND VICINITY MAP. Contractor operation and field activity specific SWPPP drawings (i.e. revised SWPPP EROSION AND SEDIMENT CONTROL PLAN) shall indicate equipment, staging, parking, and storage areas and the necessary storm water control devices; location of concrete or asphalt batch plant and storm water control devices. The SWPPP drawings shall, as a minimum, include the following:

Sheet C PROJECT LOCATION MAP and individual site EROSION AND SEDIMENT CONTROL PLAN as required per TPDES TXR 150000 and paragraph 1.3 SUMMARY, this section
and a sheet to include
EROSION AND SEDIMENT CONTROL DETAILS.

PART 3 EROSION AND SEDIMENT CONTROLS

3.1 TEMPORARY STABILIZATION

When construction activities cease for periods longer than 14 days, when

there are contract delays in turfing operation and a quick cover is required to prevent erosion, or when seasonal conditions preclude immediate permanent stabilization measures, the Contractor shall provide temporary soil stabilization. The disturbed areas eligible for temporary stabilization consists of all unpaved, graded, and disturbed portions of the site and no further field work is scheduled beyond 14 days. However, if the earth disturbing activities will be resumed in 21 days, temporary stabilization measures are not required to be initiated.

Mulching with organic material is typically practice for temporary stabilization. Erosion control blanket (see EROSION CONTROL BLANKET AND Matting paragraph, this section) shall place on excavated and stockpiled material for temporary stabilization, and on mulch materials. Compost mulch materials shall meet the requirements set forth by the United States Department of Agriculture and the United States Composting Council (USCC), Test Methods for the Examination of Composting and Compost (TMECC). Compost mulches are typically a mixture of 50% compost and 50% wood chips. Compost mulches shall apply at a minimum rate of 45 pounds per 1,000 square feet (lb/sf). The Contractor shall provide compost technical data sheet analyzed by laboratory accredited by the Seal of Testing Assurance (STA) program and the compost is STA certified. The wood chips shall not contain chemical preservatives. The Contractor shall provide compost material meeting all applicable 40 CRF, Part 503 standards for Class A biosolids and TCEQ health and safety regulations as defined in TAC Chapter 332, including time and temperature standards in Subchapter B, Part 23. Straw or hay mulches shall be free from weeds and coarse matter and apply at a minimum rate of 70 to 90 pounds per 1,000 square feet (lb/sf). Mulch shall be anchored and spread by mulch blower or by hand.

If sites only include repair of pavement, mulching will not be required but erosion control blanket and matting shall be used.

[NOTE: The Contractor shall describe the proposed temporary stabilization procedures in the Contractor operation SWPPP.]

3.2 PERMANENT STABILIZATION

Permanent stabilization on disturbed, unpaved, and graded areas shall be initiated no more than 14 days after construction activities have ceased permanently. Final or permanent stabilization shall be in accordance with specification sections 02300 EARTHWORK, 02919 TOPSOILING, 02925 ESTABLISHMENT OF TURF, 02933 PLANTING OF TREES, SHRUBS, AND VINES, mulching or compost mulching as described above, and pavement as required by this project. [NOTE: The Contractor shall described the method of permanent stabilization in the Contractor SWPPP.]

3.3 SEDIMENT BASIN

The TPDES Storm Water Discharge General Permit requires a temporary sediment basin for sites where 10 acres or more are disturbed at one time. The Contractor shall evaluate each site and determine if there is increase in runoff from the finished site. There is a concern of erosion at some site drainage to Clear Creek, a temporary and permanent sediment basin shall be provided to minimize site erosion. Reference EROSION and SEDIMENT CONTROL paragraph in SECTION 01010.

3.4 STRUCTURAL CONTROLS

NOTES: Add or delete subsections as necessary to adequately

describe erosion and sediment control structures. Typical structural control detail drawings shall be submitted with the SWPPP. See Section 01356A STORM WATER POLLUTION PREVENTION MEASURES.

3.4.1 Silt Fence

Silt Fence is used for construction site perimeter control. Silt Fence shall not be used in stream or swale. Sediment at 1/3 height of the fence shall be removed. The Contractor shall verify field conditions, inspect integrity, remove accumulated silt, and maintain silt fence.

3.4.2 Not Used

3.4.3 Stabilized Construction Ingress/Egress

The Contractor shall establish, inspect, and maintain the stabilized construction ingress/egress at the juncture between the unpaved new access road and the existing paved roadway. The Contractor shall determine locations for stabilized construction entrance/egress on the Contractor's field and operation specific SWPPP. The stabilized construction entrance/egress shall be away from waterways. The minimum width and depth of entrance is , respectively, for site or larger. For sites over 10 acres, the minimum width and depth of entrance is , respectively. If possible, a small entrance shall be incorporated into small lot construction.

3.4.4 Contractor Staging, Parking, Material Storage, Borrow and Disposal Areas Protection Device

The Contractor shall establish storm water control structures around the staging, parking, material stockpiled areas, borrow and disposal areas, and concrete or asphalt batch plant. A graveled stabilized area, compost filter socks or sediment log is acceptable. The Contractor's SWPPP shall show these locations on the vicinity map and/or site drawings and identify the applicable storm water control devices. The Contractor shall inspect and maintain the control structures at these locations.

3.4.5 Rock Berm or Check Dam

Rock Berm or Check Dam is acceptable control structure along stream or steeply sloped or barren swales. The control structure shall have open graded rock of 3 to 5 inch diameter. The graded rock shall be secured with woven sheath of diameter opening (maximum) and wire diameter of 20 gauge minimum. Sediment at 1/3 height of the berm or dam shall be removed.

3.4.6 New and Existing Inlet Protection Device

Sediment Log or Compost Filter Sock shall be placed along side with concrete block to prevent sediment from entering new curb and surface inlets at the paved areas, and at existing surface or curb inlet downstream from the disturbed site.

3.4.7 Sand Bag Berm

Sand Bag Berm is used when contributing drainage area is 1 acre or less or the slope is inappropriate for silt fence. Sand Bag Berm is acceptable for perimeter control, embankment for sediment basin, and sediment barrier for toes of slopes. The Contractor shall inspect sand bag berm after each rain, and the sand bags shall be reshaped or replaced to eliminate sediment in

runoff.

3.4.8 Outlet Protection Device

Outlet protection device shall be placed at existing and new drainage outlets to minimize soil scouring by absorbing flow energy to produce non-erosive velocity. See Paragraph, OUTLET PROTECTION OR OUTFALL VELOCITY DISSIPATION DEVICE, this section.

3.4.9 Not Use

3.4.10 Not Use

3.4.10 Not Use

3.4.11 Not Use

3.4.12 Erosion Control Blanket and Matting

Erosion control blanket shall place on soil surface to stabilize the material while grass cover is being established and place on excavated and stockpiled materials and for temporary stabilization. The material shall protect topsoil from wind and water erosion, and promote seed germination. The erosion control blanket shall be a machine-produced mat of 100% straw fiber with roughly 0.5 pound per yard and have a functional longevity of approximately 2 months. The blanket shall have a top cover of polypropylene netting with a mesh of approximately 0.50 inch by 0.50 inch. The net shall have photodegradable accelerators to enhance breakdown of netting in about 45 to 60 days.

3.4.13 Sediment Log or Compost Filter Sock

Sediment Log or Compost Filter Sock is alternate sediment control device in place of silt fence, straw bale, and rock check dam. It is composed of biodegradable or non-biodegradable material and is seed free. The control structures are typically porous, reusable, holds its shape, and it filters the sediment when storm water passes through the log or sock diameter. It shall be placed in ditch bottoms, swales, waterways, over bare soils as turf reinforcement blankets, and around catch basin, storm inlets, drainage outlets, and stockpiled area. The standard size is 12-inch diameter. For concentrated flow area, 20-inch diameter filter sock or rows of filter socks (or sediment logs) shall be used. The suggested application guidelines are listed below.

a. Level Contour: Place on level contours to assist in dissipating flow into sheet flow rather than concentrated flows. Do not construct control structures that concentrate runoff or channel water. Sheet flow of water should be perpendicular to the control structure at impact and relatively unconcentrated.

b. Flat Slopes: When possible, place control structure at a 5-foot or greater distance away from the toe of the slopes in order for the water coming from the slopes to maximize space available for sediment deposit. When a 5 foot distance is not available due to limits of construction, a second row of control structures may be required to achieve storm water pollution prevention.

c. Flow around ends: In order to prevent water flowing around the ends of the control structures, the ends of the control structures must be

constructed pointing upslope so the ends are at a higher elevation.

d. Seeded Compost Filter Socks and Filtration: For retention pond construction, a seeded compost filter sock allows vegetation to be established directly in the sock and immediately in front and back of the sock at a distance of 5 feet. Vegetation on and around the socks will assist in slowing down water for filtration. The option of adding vegetation will be determined by the Contractor. No other soil amendments or fertilizer are required for vegetation establishment.

e. Drainage area: The table below is based on slope and slope length for maximum drainage area.

Slope Length (linear feet)		Slope	Filter Sock Required
0%-2%	Flatter than 50:1	250	12 inch Diameter
2%-10%	50:1-10:1	125	12 inch Diameter
10%-20%	10:1-5:1	100	12 inch Diameter
20%-33%	3:1-2:1	50	18 Inch Diameter

PART 4 STORM WATER MANAGEMENT AND CONTROLS

4.1 RUNOFF COMPUTATIONS

[NOTE: The Contractor shall discuss this element of design.]

4.2 SURFACE DISCHARGE QUALITY

There is no concern with storm water quality discharge.

4.3 PERMANENT EROSION CONTROL STRUCTURES AND STORM WATER TREATMENT UNIT

[NOTE: The contractor shall indicate the permanent drainage structures i.e. concrete curbs and gutters, storm drainage system, concrete pavement, catch basins, asphalt pavement, drainage swale, drainage ditch, turfing, concrete culvert, pipe culvert, etc. that is applicable to this project.]

4.4 OUTLET PROTECTION OR OUTFALL VELOCITY DISSIPATION DEVICES

The outlet protection or outfall dissipation device shall provide non-erosive flow conditions at the point of surface water discharge to the ditch or swale. {NOTE: The Contractor shall describe the outfall dissipation device used in this project.]

PART 5 BEST MANAGEMENT PRACTICES (BMP)

NOTES: The Contractor shall include BMP Fact Sheets with the Contractor operation specific SWPPP.

The Contractor (and the subcontractors) shall be responsible for eliminating pollutants in storm runoff from the project site. The Contractor (and subcontractors) shall be responsible for installing and maintaining BMP to minimize storm water pollution. The Contractor operation specific SWPPP shall, as a minimum, identify BMP on Construction Practices (Dewatering Operations, Paving Operations, Structure Construction and Painting); Material Management (Material Delivery and Storage, Material Use, Spill Prevention and Control), Waste Management (Solid Waste Management, Hazardous Waste Management, Contaminated Soil Management,

Concrete Waste, Sanitary/Septic Waste Management), Vehicle and Equipment Management (Vehicle and Equipment Cleaning, Vehicle and Equipment Fueling, Vehicle and Equipment Maintenance), Dust Control for Various Site Conditions (Non-Traffic Disturbed Areas, Disturbed Areas Subject to Traffic, Material Stock Pile Stabilization, Clearing/Excavation, Demolition, Truck Traffic on Unpaved Road, Mud/Dirt Carry-Out), and Contractor Training (Employee and Subcontractor Training).

5.1 CONSTRUCTION PRACTICES

Dewatering Operations: The Contractor (and subcontractor) shall prevent discharge of sediment by methods of sediment control, containment, and disposal. In project areas suspected of potential toxic or petroleum products contamination, the water shall be tested to determine method of disposal.

Paving Operations: The Contractor (and subcontractor) shall avoid discharge of pollutants to storm drains by avoiding paving in wet weather or anticipation of such event, storing material in covered containers, covering and berming storage areas, establish control structures, cover on-site storm grates, and worker and subcontractor training.

Structure Construction and Painting: The Contractor (and subcontractor) shall prevent pollutants in storm runoff by covering, or berming material storage areas, keeping job site clean and orderly, using safer alternate products, stabilizing adjacent disturbed areas, storing material in secondary containment, protecting on-site storm drain, establish control structures, and training of workers and subcontractor.

Solid Waste Materials: Trash and uncontaminated construction debris shall be placed in appropriate covered waste containers. Waste containers shall be emptied regularly; they shall not be allowed to overflow. The disposal area of excavated material from project construction shall not be utilized for waste disposal. Routine janitorial service shall be provided for all construction buildings and surrounding grounds. No construction waste materials, including concrete, shall be buried or otherwise disposed of on-site. The Contractor shall brief all on site personnel on good house-keeping and waste minimization.

5.2 MATERIAL MANAGEMENT

Material Delivery and Storage Practice: The Contractor (and subcontractor) shall prevent or reduce discharge of pollutants to storm water by minimizing and on-site storage of hazardous and toxic (HT) materials, storing HT in clearly labeled, corrosion-resistant containers with secondary containment at designated and COR-approved areas, conducting frequent inspection, keeping current inventory of construction materials on site, training of workers and subcontractor. The storage of reactive, ignitable or flammable liquids shall comply with applicable fire codes of the project area. The Contractor shall contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements.

Material Use and Inventory: The common on-site materials are: pesticides and herbicides, fertilizers, detergents, concrete material, petroleum-based products, fertilizers, tar, asphalt, steel reinforcing bars, other hazardous chemicals such as acid, lime, solvents, curing compounds, sealants, paints, glues, fertilizers, steel reinforcing bars, etc. The Contractor (and subcontractor) shall use less hazardous, alternate or

environmental friendly material. The Contractor shall have (1) a list of construction materials used on site, (2) a list of materials and associated potential pollutants, and (3) method of storage and containment in the Contractor operation specific SWPPP. The Material Safety Data Sheet for each construction material on-site shall be in the Contractor's field and operation activity specific SWPPP and will be available on request by regulator agency visitors, safety officers, or COR.

Spill Prevention and Control: The Contractor (and subcontractor) shall store HT material in covered containers and inside a fenced area, have temporary fuel storage tank bermed or contained to meet applicable Fire Code, place readily accessible spill clean-up materials, have protocol for stop work immediately, notification, clean-up, labelling, storage and packaging, transportation, disposal, record-keeping, closure activities, and provide training to workers and subcontractor for response to spills.

5.3 WASTE MANAGEMENT

Solid Waste: Solid waste materials (i.e. excess fresh concrete, grout, mortar or uncontaminated debris) shall be placed in covered containers, and recycled, if possible, reference SECTION 01368. Trees and shrubs from site clearing shall be shredded and turn-in as recycled material to Foert Hood Sanitary Landfill. Packaging materials such as wood, plastic, and paper shall be recycled to the maximum extent possible. The Contractor shall designate waste containers for segregating waste (domestic, metal, aluminum or plastic). Dry paint cans shall be recycled. The Contractor shall designate waste disposal area, have a routine janitorial service for all structures and surrounding grounds, and have a routine schedule to service waste containers. The disposal area of excavated material from project construction shall not be utilized for solid or refuse waste disposal. Personnel on the job site shall be briefed on minimizing disposal to landfill by waste segregation and recycling.

Hazardous and Toxic Waste: All excess on-site material such as paints, solvents, petroleum products (fuel, oil, and grease), herbicides, pesticides, acids for cleaning masonry, concrete curing compounds, sealants, paint strippers, wastes from oil-based paint, and glues could become HT waste. Containers of excess material shall be labeled and managed according to the labels and as recommended by the product manufacturers. If there are no instructions provided, the Contractor shall turn in contained waste to the DPW CLASSIFICATION UNIT per SECTION 01368.

Buildings to be renovated under this Contract shall require removal of regulated materials per SECTION(s) 13280, 13284 and protection of workers, occupants, and environment per SECTION(s) 13280 and 13282.

Contaminated Soil: If suspicious of soil contamination during soil moving activities, the Contractor (and subcontractor) shall stop work, notify COR, and establish containment to prevent soil transport or runoff from that location. For removal of contaminated soil, a WORK PLAN shall be prepared for COR approval prior to handling and management of the material. The WORK PLAN shall at least include the following: containment, sampling & analyses, notification to regulatory agencies, transportation, worker safety, training & environmental monitoring, disposal, and documentation and record-keeping.

Construction and Concrete Waste: Reference SECTION 01368 for detail. Construction waste or surplus materials, demolition building debris, scrap metal, rubber, plastic, glass, concrete, and masonry products shall be

segregated and recycled to minimize landfill disposal. No construction waste shall be buried or disposed of on-site. Concrete waste shall be controlled and minimized by appropriate storage methods for dry and wet materials, and control the amount of concrete and cement mixed on site. Sweepings from exposed aggregate concrete shall be collected and returned to aggregate stockpile and they shall not be washed into streets or storm drains. Washout of concrete truck shall be at a designated location that is (1) at least 50 feet from storm drains, open ditches, or water bodies, and (2) surrounded by a containment berm with a temporary pit or sediment trap with impermeable liner for containment and settling of washout. Settled solids and set concrete from the pit or trap shall be removed and disposed of properly. Sediment shall be removed and disposed of in accordance with local regulations, and water from the pit or trap shall be pumped to a sanitary sewer with written approval from the COR.

[NOTE: Delete if not applicable to the project] Sanitary/Septic Waste: The on-site sanitary facilities shall be established at a convenient location. Facility location, design, maintenance, and waste collection practices shall be approved by COR and are in accordance with local regulations. The Contractor (and subcontractor) shall have a routine schedule for waste pump out by a licensed hauler. Septic waste treatment system shall have a pre-construction permit from the local health regulating agency and have contract service with a licensed company. Temporary sanitary facilities discharging to sanitary sewer system shall be approved by the operator of the system and properly connected to avoid illicit discharges. Wastewater from water-based paint shall not be discharged as sanitary waste.

[NOTE: Delete if not applicable to the project] Building Exterior Cleaning or High-pressure Wash: Storm drains shall be protected by approved storm water control device. Wash onto dirt area, spade in, settle solids in pit, collect (mop up) and discharge to sanitary sewer (with approval from sewer operator). If the exterior paint contains lead exceeding the levels stated in the Consumer Safety Standard, mercury or mildewcide, the wash water shall be collected and disposed of as HT waste.

Street/Pavement Cleaning: Water used for this activity shall be minimized and sediment basin shall be used to contain wastewater. At completion of construction, the silt shall be removed and disposed of in accordance with applicable regulations, and water from the basin shall be pumped to a sanitary sewer with written approval from the COR.

5.4 VEHICLE AND EQUIPMENT MANAGEMENT

Off-site Vehicle Tracking and Dust Control: The Contractor is required to keep vehicles from tracking soils from the project, borrow, and disposal sites. Temporary parking area(s) to be used 30 calendar days or more for the Contractor's equipment or personal vehicles shall be a stabilized gravel area with storm water control device. The temporary parking areas shall be removed by the Contractor upon project completion and restored to the satisfaction of the COR. Sprinkling, chemical treatment, light bituminous treatment, or similar methods shall be used for dust control; see Sections 01355 ENVIRONMENTAL PROTECTION and 01561 DUST CONTROL. Materials to be transported by truck or other equipment that promote fugitive particle emissions shall be covered and/or sprayed. Use of sprinkling shall be controlled to prevent runoff.

Vehicle and Equipment Cleaning: Washing shall be performed off site at a commercial washing facility that has an oil/water separator as pre-treatment prior to sanitary sewer connection. If washing must occur on

site, the wash area shall have written approval from the COR. The on-site wash area shall be bermed from contact with storm drainage system, and detergent shall be bio-degradable. Wastewater shall drain into a lined sediment basin constructed by the Contractor. After project completion, the Contractor shall clean the basin, test and dispose of sediment, in accordance with applicable regulations and to the satisfaction of the COR. Steam cleaning is prohibited on site because it generates significant pollutant concentrations.

Vehicle and Equipment Fueling: Fueling shall be off-site. If fueling must occur on-site, a written approval shall be obtained from COR. If fueling is allowed by the COR, it shall be at a designated area, at least 50 feet away from drainage courses. Fueling operations shall avoid topping of fuel tank, and avoid mobile fueling of mobile construction equipment. Fueling locations shall use secondary containment (i.e. a liquid tight berm and a impermeable liner), have a stockpile of cleanup material, and absorbent material for immediate clean-up of minor spills or other spill protection measures. A permit shall be obtained from state or local regulatory agency for all on-site fuel storage tanks. In case of spill, avoid hosing down or burial of spilled fuel, documentation, reporting to COR and regulatory agency, clean-up per regulation is required. The temporary fuel containers placed on-site shall meet the industrial standard, labeled and stored in accordance with applicable Federal, state, and local Fire codes.

Vehicle and Equipment Maintenance: Outdoor vehicle or equipment maintenance is a significant potential source of storm water pollution. Activities include engine repair, changing fluids, etc. shall be prohibited on job site.

Vehicle and Equipment Parking: All vehicle or equipment parked on-site shall have drip pan or drop cloth to catch spill or leak. Vehicle or equipment (the Contractor and the subcontractor) shall regularly inspect for leaks and schedule routine maintenance to reduce the potential for leaks.

5.5 EMPLOYEE AND SUBCONTRACTOR TRAINING

The Contractor is responsible for providing training for all workers (including the subcontractor) on the job site. The objectives in training are to provide a clear concept of activities or problems that generate pollutants to storm water, identify solutions (BMPs), promote ownership of the problems and solutions, and integrate feedback into training and BMP implementation. A certificate to verify completion of training shall be signed by all trained personnel.

5.6 STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

The designer shall use the OUTLINE SWPPP to prepare a Basic SWPPP. The Contractor shall use the Basic SWPPP to prepare the Contractor's field and operation specific SWPPP. The SWPPP shall be retained at the job site at all times and readily available to inspector in case of site inspection conducted by the regulating agency. The Construction Site Notice shall indicate the location of SWPPP. The SWPPP shall be completed before filing for NOI. It shall be implemented prior to start of soil disturbing activities. It shall be updated, as necessary, to reflect changing site conditions, BMP practices, new operations or areas of responsibility by the Contractor or sub-contractor. The SWPPP REVISION RECORD, INSPECTION & MAINTENANCE REPORT, NOI & NOT from each party (Contractor and Government), RECORD OF MAJOR CONSTRUCTION ACTIVITIES AND SUBSEQUENT STABILIZATION,

NON-STORM WATER DISCHARGE ASSESSMENT AND CERTIFICATION, and others as listed in PART 12 ATTACHMENT shall be a part of the SWPPP.

5.7 SPILL CONTROL AND REPORTING

In case of spill of hazardous, toxic, and radiological waste (HTRW), the Contractor shall stop work, contain spill, notify the COR and Safety Office, and execute spill control per the SPILL CONTROL PLAN as required in specification SECTION 01355 ENVIRONMENTAL PROTECTION. Spill containment, notification, clean-up, restoration, reporting, record-keeping, etc. shall be in accordance with 40 CFR 110, other applicable Federal, state, and local regulations, and to the satisfaction of the COR.

PART 6 TIMING OF CONTROLS AND ACTIVITIES.

NOTES: Discuss the sequence of major activities and how they are related to the pollution prevention measures. Identify situations which are critical to successful construction and pollution prevention, but will not limit the Contractor's ability to determine construction phasing schedule.

The Contractor shall (1) sequence major soil disturbing activities to preserve existing vegetation, (2) minimize area of disturbance, (3) discuss storm water control devices, (4) do not disturb an area until it is necessary to proceed with field work, (5) temporary or permanent stabilize disturbed areas as soon as practicable, (6) delay construction of infiltration measures until the end of project when upstream drainage areas are stabilized and established, (7) maintain storm water control devices until stabilized disturbed areas have achieved final stabilization, (8) check weather forecast to plan major construction activities and minimize potential pollutants. Final stabilization depicts soil disturbing activities at the site have been completed and a uniform (e.g. evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of all native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as use of rip rap, gabions, or geotextiles) have been employed.

[NOTE: Contractor shall choose the applicable storm control structures for the project site.]

- Install [compost filter socks] [silt fences] [sediment log] around perimeter & down slope of construction site.
- Construct stabilized construction entrances.
- Install controls around contractor staging, stockpiled storage, parking, borrow, and disposal areas for on-site and off-site locations.
- Clearing and Grubbing
- Install inlet protections at all existing storm grates (i.e. curb inlets surface inlets, manholes, etc.)
- Install controls (i.e. filter socks, check dam, sediment log, diversion/earth dike) at outfall locations and natural drainage ways down stream from the construction site.
- Regulated material abatement from structures to be demolished
- Demolition of site structures
- Grading
- Implement Temporary Stabilization on graded areas that have no scheduled field work beyond 14 days
- Construct storm water treatment unit or interceptor

- Construct permanent storm water management structures
- Trenching and excavation for utilities, trenching and excavation
- Cover all excavated or other soil stockpiles with soil retention blankets at the end of each work day and at the threat of precipitation.
- Install inlet protections (i.e. compost filter socks or other applicable control measures) at all new storm grates (i.e. curb inlets surface inlets, manholes, etc.)
- Backfill the utility trenches in a timely manner to minimize erosion.
- Monitor weather using National Weather Services reports to track conditions and alert crews to forecast rainfall or dust storm event and avoid paving, concrete saw cutting, dust or pollutant generating activities.
- Stabilize disturbed soil before rainfall events.
- Paving and other flatwork.
- Implement permanent stabilization.
- Routinely inspect and maintain erosion and sediment structural control structures; evaluate BMP & revise SWPPP for change conditions or field activities; assess and certify non-storm water discharges; maintain field records and training logs; [monitor discharge from concrete batch plant].
- maintain (i.e. water, fertilize, mow, reseed (if necessary) the temporary and permanent stabilized areas until final project acceptance.
- Remove all controls when the project area has achieved final stabilized (per TPDES General Construction Permit TXR 150000) when all construction is completed and accepted by the Contracting Officer. After site work completion and prior to project acceptance, the Contractor shall perform inspection and maintenance of storm control structures.

PART 7 COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS

In compliance with the National Environmental Policy Act of 1969, as amended, The Environmental Assessment (EA) and Finding of No Significant Impact (FNSI) for the Transformation to Modular Brigades and Constructing Support Facilities at Fort Hood, Texas is prepared. The EA and FNSI can be obtained at website, <http://www.dpw.hood.army.mil/HTML/PPD/Pnotice.htm>

Prior to renovation of structures, the Contractor shall perform asbestos abatement, protect workers from airborne exposure to asbestos fibers, paint dust, and removal and recycling of items containing other regulated materials. A 10-day advance notification to Texas Department of Health (TDH) is required prior to start work. The Contractor shall coordinate with Fort Hood Environmental and initiate this activity to avoid delay of project schedule.

In compliance with Clean Water Act, Section 402, the Contractor and the subcontractor shall conform with all applicable TPDES General Construction Permit stipulations to discharge storm water during construction. In addition, the Contractor (including the subcontractor shall comply with the Government approved Contractor's operation specific Storm Water Pollution Prevention Plan, BMP, and contract requirements as stated in this section. A 48-hour waiting period after Notice of Intent submittal for Storm Water Discharge Permit is required. The Contractor shall submit SWP3 for Government approval at initial design submittals after contract award to avoid delay of project schedule._____

AM #0002 At the initial design submittal, the Contractor shall verify if Clean Water Act Section 404 permit is required for each site, the 404 Permit shall be obtained from Regulatory Branch, USACE.

PART 8 MAINTENANCE AND INSPECTION PROCEDURES

The Contractor shall designate a Storm Water Pollution Prevention (SWPPP) Inspector on-site to perform SWPPP quality control. All BMP and control structures shall be inspected at least once every fourteen (14) calendar days and within twenty-four (24) hours following any storm event of 0.5 inch or greater. In addition to performing inspection and maintenance of storm control device, the designated SWPPP inspector is also responsible for SWPPP revision, documentation and record-keeping. The Contractor Designated SWPPP Inspector shall have a basic knowledge of the engineering principles in eliminating pollutants in storm water; past experience and thoroughly understand the requirements of the Storm Water Discharge Construction Permit; BMP; Government requirements as stated herein; approved Contractor's SWPPP. The Contractor shall provide worker briefing and training on SWPPP & BMP prior to starting soil disturbing activities.

Inspection of erosion and soil loss from the outfall and perimeter of the site. Temporary erosion control measures shall be inspected for bare spots and washouts. Discharge points shall be inspected for signs of erosion or sediment. Locations where vehicles enter and leave the site shall be checked for signs of off-site sediment tracking, including erosion control structure at contractor staging, material borrow, disposal, and stockpiled areas. The Contractor shall continually review the Best Management Practices (BMP) and effectiveness of SWPPP program. All deficiencies shall be corrected and recorded in Section 01421R SWPPP INSPECTION AND MAINTENANCE REPORT and a current copy shall be provided to the COR. Corrections to these problems shall be implemented within seven (7) calendar days. After final stabilization has been achieved, the Contractor shall inspect the site once a month until final inspection and project acceptance by the COR.

PART 9 LIST OF ON-SITE MATERIALS, POTENTIAL POLLUTANTS AND SOURCES

The Contractor shall identify the construction materials to be brought on to the job-site. In addition, the Contractor shall identify the potential pollutants from the construction site and sources based on the construction materials brought on-site, paint, sealant, fuel, etc. The Contractor shall discuss BMP to reduce pollutants in storm runoff.

The Contractor shall state in the Contractor operation specific SWPPP, if a concrete or asphalt batch plant is at the job-site. The storm water control structures applicable for the batch plant shall be shown on the drawing. The Contractor shall also include an I&M report for monitoring of discharge from the batch plant. This record shall be submitted per TPDES General Construction Permit TXR 150000 and kept as as record by the Contractor.

The Contractor shall have a Material Safety Data Sheet for each construction material or substance brought on-site. It shall be available to the COR on request.

PART 10 PROHIBITION ON NON-STORM WATER DISCHARGES

In accordance with the Federal Register, Volume 63, No.128, July 6, 1998 Notices, non-storm water discharge is prohibited during construction of the project, except for a list of non-storm water discharges. The following

list of non-storm water discharges from active construction site is allowed and is developed based on the above guideline.

- fire fighting activities,
- fire hydrants flushing,
- vehicle wash waters which do not contain detergent or leaked fluids
- dust control runoff to minimize off-site tracking of vehicles,
- potable water sources including waterline flushing,
- routine external building wash down which does not use detergents and the exterior paint that does not contain mercury, lead, cadmium, and mildewcides,
- pavement wash waters where spills or leaks do not contain hazardous, toxic, radiological material or detergent,
- air conditioning condensate,
- uncontaminated spring or ground water,
- foundation and footing drains which do not contain contaminated process materials such as solvents

The Contractor designated SWPPP Inspector shall perform routine inspection and record findings in the NON-STORM WATER DISCHARGE ASSESSMENT AND CERTIFICATION.

PART 11 CONTRACTOR COMPLIANCE

NOTES: The Contractor shall plan in advance the to submit SWP3 and submit NOI to TCEQ to allow for 48 hours waiting period prior to site disturbance. The Contractor shall use this basic SWPPP to prepare a SWPPP that includes narrative, drawings (Storm Water Control Plans), and ATTACHMENTS. Prior to submitting NOI to regulatory agency, the Contractor shall submit the operation SWPPP for review and approval by the Government.

11.1 SWPPP AND NOTICE OF INTENT (NOI)

The Contractor shall prepare a field and operation activity specific SWPPP.

The Contractor shall submit the SWPPP for review and approval. The hard copy SWPPP shall include a revised Section 01421 and drawings (preferable size 11" by 17") which meets requirements as stated below, and have ATTACHMENTS (PART 12). The SWPPP electronic format is compatible with the contract requirements. The Contractor's SWPPP shall, as a minimum, include the following: (1) describe each physical location & LATITUDE and LONGITUDE of each area pertaining to the construction (i.e. new facility site, demolition site, borrow site, and excavated non-contaminated material disposal site); (2) the project start and completion dates; (3) bid options, project phasing, sequence of construction activities and pollution control measures; (4) Best Management Practices (BMP); 5) list of on-site construction materials, methods of storage, & pollution control measures; (6) potential pollutants, sources, and control measures; (7) Soil data and quality of any discharge from site; (8) each construction area runoff coefficient; (9) depict on grading plans (include new and existing grades) structural and non-structural storm control devices, site stabilized entrance/exit, contractor staging, parking, equipment and material storage area, stockpiled, borrow, and disposal areas), temporary and permanent drainage inlet & site outfall controls, drainage patterns, site drainage features (existing and new wetlands, creeks, sediment ponds), limit of clearing and grubbing, outline of areas not to be disturbed, haul route, surface water flow direction arrows, areas that will receive stabilization practices, location of on-site fuel tank with containment berm and impermeable liner, location of on-site asphalt/concrete batch

plant with control measures, and site map legend; (10) name and qualification of a Designated SWPPP Inspector to inspect, maintain/repair erosion control structures, record findings and subsequent actions, train on-site worker on storm water pollution prevention, evaluate BMP and revise SWPPP, assess non-storm, monitor concrete/asphalt plant discharges; (11) record-keeping of start dates for major construction activities (clearing and grubbing, grading, trenching & excavation; dirt moving, etc.); dates when major construction activities temporarily or permanently cease on a portion of site; the start date and location of stabilization; dates of inspection and repair for erosion and sediment control structures; release dates of reportable quantities (RQ) for oil and hazardous substances per 40 CFR Parts 110, 117 and 302; (12) Contractor Certification of On-site Storm Water Pollution Prevention Training to workers; (13) SWPPP revision date for changed site conditions, operation, and BMP; (14) prepare and submit Contractor's NOI, and pay for NOI fee (if required by the regulatory agency). The Contractor shall submit NOI and wait at least 48 hours (2 full days) prior to start soil disturbing activities in the State of Texas; (15) Contractor shall prepare Government NOI, submit for an authorized signature and the Government shall submit the NOI.

Prior to submitting NOI to the regulatory agency, the Contractor shall submit SWPPP (narrative and drawings), NOI, and ATTACHMENTS (PART 12) for review and approval by COR. The mailing addresses for NOI are listed below.

TEXAS

Mailing Address:

Texas Commission On Environmental Quality (TCEQ)
Storm Water & General Permits Team; MC-228
P.O. Box 13087
Austin, TX 78711-3087
(Use for regular and certified mail)

NOI Payment Address (by regular U.S. Mail):

Texas Commission on Environmental Quality (TCEQ)
Financial Administration Division
Cashier's Office, MC-214
P.O. Box 13088
Austin, TX 78711-3088

NOI Payment Physical Address:

Texas Commission on Environmental Quality (TCEQ)
Financial Administration Division
Cashier's Office, MC-214
12100 Park 35 Circle
Austin, TX 78753
(Use for overnight express carrier deliveries (U.S. Post Office Express Mail, FED EX, UPS, etc.))

11.1.1 On-Site Construction Document And Record-Keeping

A copy of each of the following shall be maintained at the project site at all times: the USACE approved Contractor operation SWPPP and all required ATTACHMENTS as stated in PART 12, this section, the TPDES TXR150000 General Permit for storm water discharges during construction, the Project Site Notice, the Contractor NOI, the Government NOI, the Contractor storm water discharge permits after receipt from the regulatory agency, the Government storm water discharge permit after receipt from the regulatory agency.

The Contractor shall post a Project Site Notice near the main entrance of each construction access point. The Project Site Notice shall have the following information: project start and completion date, a brief project description, name and telephone number of an operator's representative (for each Contractor & the Government), the location of SWPPP, signature and certification by an authorized person on the PROJECT SITE NOTICE.

All records pertaining to the Storm Water Discharge Permit shall be maintained for a minimum of three (3) years from the date that a NOT is submitted to the regulatory agency.

11.1.2 Storm Water Discharge General Permit Fees And Fines For Non-Compliance

The Contractor shall be responsible for the initial Contractor storm water discharge permit NOI fee (if required by the regulatory agency) and the subsequent annual permit fees for both co-permittees (the Contractor and the Government) during construction. The subsequent annual fees for both co-permittees (the Contractor and the Government) during construction shall include the annual water quality fee or annual construction fee, and batch plant monitoring fee. Any fines levied by regulatory agency regarding non-compliance with TPDES Storm Water Discharge General Permit or requirements stated in this section shall be the Contractor's responsibility.

11.2 NOTICE OF TERMINATION (NOT)

After completion of final stabilization and project acceptance with written approval by the COR, the Contractor shall prepare copies of the Notice of Termination (NOT) separately for the Contractor and the Government. The Contractor shall submit his/her own NOT to the appropriate regulatory agency. The Contractor shall provide the Government NOT to the COR for the signature of an authorized person, and the Government will submit the signed NOT to the appropriate regulatory agency. A copy of the each signed NOT shall be provided to the COR.

11.3 NOTIFICATION TO MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)

A copy of each NOI and NOT (for large construction site), a copy of NOC (Notice of Change is required when relevant information of the initial NOI needs to be changed), and a copy of Construction Site Notice (applicable for small construction site) shall be sent to MS4. For some projects, there is a possibility of more than one MS4. The Contractor shall notify all MS4 within the project site. The Contractor shall verify with Fort Hood if MS4 notification to the local municipality is required.

III Corps & Fort Hood
Attn: AFZF-PW-ENV (Riki Young)
Fort Hood TX 76544-5028
Telephone: (254) 387-8712]

PART 12 ATTACHMENTS TO SWPPP, AND START WORK

The Contractor shall provide the following attachments in the Contractor operation and field specific SWPPP. The list of attachments shall include CONSTRUCTION SITE NOTICE; NOTICE OF INTENT (NOI) signed by the Contractor; GOVERNMENT NOTICE OF INTENT (NOI) to be signed (or signed) by the Government; CONTRACTOR NOTICE OF TERMINATION (NOT) (to be signed when

conditions are met); GOVERNMENT NOTICE OF TERMINATION (NOT) (to be signed when conditions are met); CONTRACTOR STORM WATER CONTROL INSPECTION AND MAINTENANCE REPORT; CONTRACTOR CERTIFICATION OF ON-SITE STORMWATER POLLUTION PREVENTION (SWPP) and BMP TRAINED PERSONNEL LOG; OPERATOR (CONTRACTOR/ SUBCONTRACTOR) CERTIFICATION OF COMPLIANCE FOR TPDES, STATE AND LOCAL WASTE DISPOSAL, SEPTIC SYSTEM SANITARY SEWER REGULATIONS; RECORD OF SWPPP REVISION; RECORD OF MAJOR CONSTRUCTION ACTIVITIES AND SUBSEQUENT STABILIZATION PRACTICES (TEMPORARY/PERMANENT)(for Grading, Excavation, Ceasing/Resuming Construction); CONTRACTOR CERTIFICATION FOR SWPPP; RESPONSIBLE PARTIES FOR SITE POLLUTION PREVENTION MEASURES (which identifies the name and qualifications of a Designated Site Inspector, other responsible parties such as the subcontractors); NON-STORM WATER DISCHARGE ASSESSMENT AND CERTIFICATION; AUTHORIZED SIGNATORY; BATCH PLANT DISCHARGE MONITORING RECORD (if applicable); TPDES General Permit; STORM WATER DISCHARGE PERMIT issued by the regulatory agency to the GOVERNMENT (when received), and STORM WATER DISCHARGE PERMIT issued by the regulatory agency to the CONTRACTOR (when received).

The Contractor shall disturb soil after approval of the Contractor's SWPPP, compliance to PART 7 and PART 11, and meet the waiting period for both the Contractor and Government NOI submittals to the regulatory agency.

-- End of Section --

SECTION 01451

CONTRACTOR QUALITY CONTROL

AM #0002

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740 (2001) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

ASTM E 329 (2000b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all design and construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise

acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2 QUALITY CONTROL PLAN

The Contractor shall furnish for review by the Government, not later than 10 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 60 days of operation. Design and construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started. See Section 01430 DESIGN QUALITY CONTROL for the design QC requirements.

3.2.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all design and construction operations, both onsite and offsite, including work by subcontractors, designers of record, consultants, architect/engineers (AE), fabricators, suppliers, and purchasing agents:

- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.
- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, designers of record, consultants, architect engineers (AE), offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES and 01430 DESIGN QUALITY CONTROL.
- e. Control, verification, and acceptance testing procedures for each

specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. Laboratory facilities approved by the Contracting Officer shall be used.)

- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.
- g. Procedures for tracking design and construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.
- h. Reporting procedures, including proposed reporting formats.
- i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of design and construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Postaward Conference, before start of design or construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 5 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, design activities control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the

Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Construction Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager shall receive direction and authority from the CQC System Manager and shall serve as a member of the CQC staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, shop drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer, graduate architect, or a graduate of construction management, with a minimum of one years construction experience on construction similar to this contract or a construction person with a minimum of five years in related work. The Contractor may have assistants at individual sites when allowed by the Contracting Officer. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. Assistants shall be on their sites at all times during construction and shall be employed by the prime Contractor although under the direct supervision of the CQC System Manager. The CQC System Manager and assistants shall be assigned no other duties-. [AM #0002] In addition to the CQC System Manager, the contractor shall have CQC's over the Building Renovations, Site Work, and Relocatable Buildings phases of work. These additional CQC's shall be employed by the prime contractor and have no other duties. Their requirements shall be the same as the CQC System Manager. A total of 4 CQC's including the System Manager are required. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate and assistants shall be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

3.4.3.1 CQC Staff

A staff shall be maintained under the direction of the CQC system manager to perform all QC activities. The staff must be of sufficient size to ensure adequate QC coverage of all work phases, work shifts and work crews involved with the construction. Except as required for specialized CQC personnel, these personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned QC responsibilities and must be allowed sufficient time to carry out these responsibilities.

3.4.3.2 Specialized CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: electrical, mechanical, civil, submittals clerk, Testing, ~~and~~ Adjusting and Balancing (TAB) Personnel **[AM #0002] and Fire Detection/Protection**. These individuals may be employees of the prime or subcontractor; be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals shall have no other duties other than quality control.

Experience Matrix

Area & Qualifications

a. Civil

Graduate Civil Engineer with 2 years experience in the type of work being performed on this project or technician with 5 yrs related experience

b. Mechanical

Graduate Mechanical Engineer with 2 yrs experience or person with 5 yrs related experience

c. Electrical

Graduate Electrical Engineer with 2 yrs related experience or person with 5 yrs related experience

d. Submittals

Submittal Clerk with 1 yrs experience

e. Testing, Adjusting and Balancing (TAB) Personnel

Specialist must be a member of ASSOCIATED AIR BALANCE COUNCIL (AABC) or an experienced technician of the firm certified by the NATIONAL ENVIRONMENTAL

BALANCING BUREAU (NEBB).

[AM #0002]

f. Concrete, Pavements, Soils Technician

Materials Technician with 2 yrs experience for the appropriate area

g. Fire Detection/Protection System

Registered Professional Engineer with 5 yrs experience for the appropriate work. The registered professional engineer shall be on-site during the aspects/phases as stated in SECTION 01330, Paragraph 1.10.1.5 Item a. Fire Protection and Detection Submittals.

3.4.4 Additional Requirement

In addition to the above experience and education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This class is mandatory for the Contractor's quality control manager. Certificates issued upon successful completion are valid for five years. This course is periodically offered at the Fort Worth District, Corps of Engineers Office, Federal Building, Room 1A03, 819 Taylor Street, Fort Worth, Texas. Attendees must be fluent in the English language (able to read and write) at the high school level.

Registration is required; call 817-886-1949 or 817-886-1841 for times and reservations. There is no charge for the course; however the Contractor will pay for travel and per diem costs.

3.4.5 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERIES

Submittals, if needed, shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements. When UFGS guide specification Sections 15950A HEATING, VENTILATING AND AIR CONDITIONING (HVAC) CONTROL SYSTEMS; 15951A DIRECT DIGITAL CONTROL FOR HVAC; 15990A TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS; or 15995A COMMISSIONING OF HVAC SYSTEMS are included in the Contract, the submittals required by those sections shall be coordinated with Section 01330 SUBMITTAL PROCEDURES to ensure adequate time is allowed for each type of submittal required..

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of

control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

- a. A review of each paragraph of applicable specifications, reference codes, and standards. A copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by Government personnel until final acceptance of the work.
- b. A review of the contract drawings.
- c. A check to assure that all materials and/or equipment have been tested, submitted, and approved. **(Only coded A or B shop drawing submittals will be considered "as approved." Submittals other than those coded A or B required to be resubmitted will delay the preparatory phase meeting until they have been resubmitted and approved.)**
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- g. A review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- j. Discussion of the initial control phase.
- k. The Government shall be notified at least 72 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the

foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

- a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government shall be notified at least 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
- g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite

production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of \$2,000 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing of Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Government-contract laboratory designated by the Area Office.

Coordination for each specific test, exact delivery location, and dates will be made through the Area Office.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the Contract Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager, designer(s) of record, and the CQC staff shall conduct an inspection of the work. A punch list of items which do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into

increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- a. Contractor/subcontractor and their area of responsibility.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
- d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.
- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.
- g. Off-site surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and

instructions or corrective actions.

- i. Instructions given/received and conflicts in plans and/or specifications.
- j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 12 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

- a. Minimum construction quality control report and the required preparatory and initial inspection documentation.
- b. All tests of piping systems or portions thereof shall be recorded on the "Piping System Test Report".
- c. Built-up, Modified bitumen, Elastomeric single-ply roofing operations, including materials used, shall be reported on "CONTRACTOR'S INSPECTOR ROOFING CHECK LIST AND TEST REPORT."
- d. Maintain current records of drilled pier construction and furnish to the Contracting Officer on a weekly basis detailed reports recorded on SWF Form 1175-J, "Construction Record Drilled Piers".
- e. When operation and maintenance instructions for equipment are furnished to Government representatives by the Contractor, the Contractor's representative shall record on a form similar to that attached hereto the applicable data, including the name, organization, and signature of each person attending the instructions.
- f. All tests on engine-generator sets shall be recorded on "Appendix A (FWDR form 415-1-170)" and "Appendix B (Frequency Control & Voltage Regulation)" forms.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take

immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

SAMPLE FORMS

Sample QC forms follow this page.

(Sample of typical Contractor Quality Control Report)

CONTRACTOR'S NAME
(Address)

DAILY CONSTRUCTION QUALITY CONTROL REPORT

Date: _____ Report No. _____

Contract

No.: _____

Description and Location of work:

WEATHER: (Clear) (P. Cloudy) (Cloudy);
Temperature: _____ Min. _____ Max;
Rainfall _____ inches.

Contractor/Subcontractors and Area of Responsibility with Labor Count for Each

a. _____

b. _____

c. _____

d. _____

Equipment Data: (Indicate items of construction equipment, other than hand tools, at the job site, and whether or not used.)

1. Work Performed Today: (Indicate location and description of work performed. Refer to work performed by prime and/or subcontractors by letter in Table above. If no work is performed, report the reason.)

2. Results of Surveillance: (Include satisfactory work completed, or deficiencies with action to be taken.)

a. Preparatory Inspection:

b. Initial Inspection:

c. Follow-up Inspections:

3. Test Required by Plans and/or Specifications performed and Results of Tests:

4. Verbal Instructions Received: (List any instructions given by Government personnel on construction deficiencies, retesting required, etc., with action to be taken.)

5. Remarks: (Cover any conflicts in plans, specifications, or instructions or any delay to the job.)

6. Results of Safety Inspection: (Include safety violations and corrective actions taken.)

Contractor's Inspector

Page 1

CONTRACTOR'S VERIFICATION: The above report is complete and correct and all material and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications except as noted above.

Contractor's Chief of Quality Control

NOTE:

DO NOT LEAVE REPORT ITEMS BLANK

Items 1. through 6. must be reported every day. If there is no other report on an item, enter the work "none" in the reporting space. Reports with items left blank will be returned as incomplete.

Page 2

PREPARATORY PHASE CHECKLIST

Contract No. _____ Date: _____

Definable Feature: _____ Spec Section: _____

Gov't Rep Notified _____ Hours in Advance Yes _____ No _____

I. Personnel Present:

Name	Position	Company/Government
1. _____		
2. _____		
3. _____		
4. _____		
5. _____		
6. _____		
7. _____		
8. _____		
9. _____		
10. _____		

(List additional personnel on reverse side)

II. Submittals

1. Review submittals and/or submittal log 4288.
Have all submittals been approved? Yes _____ No _____

If no, what items have not been submitted?

a. _____

b. _____

c. _____

2. Are all materials on hand? Yes _____ No _____

If no, what items are missing?

a. _____

b. _____

c. _____

3. Check approved submittals against delivered materials. (This should be done as material arrives.)

Comments _____

III. Material storage

Are materials stored properly? Yes _____ No _____

If No, what action is taken? _____

IV. Specifications

1. Review each paragraph of specifications.

2. Discuss procedure for accomplishing the work.

3. Clarify any differences.

V. Preliminary Work and Permits

Ensure preliminary work is correct and permits are on file.

If not, what action is taken? _____

VI. Testing

1. Identify test to be performed, frequency, and by whom.

2. When required?

3. Where required?

4. Reviewing Testing Plan.

5. Have test facilities been approved?

VII. Safety

1. Review applicable portion of EM 385-1-1.

2. Activity Hazard Analysis approved? Yes _____ No _____

VIII. Corps of Engineers comments during meeting.

CQC REP

PPC Page 3

INITIAL PHASE CHECKLIST

Contract No. _____ Date: _____

Definable Feature: _____

Gov't Rep Notified _____ Hours in Advance Yes _____ No _____

I. Personnel Present:

	Name	Position	Company/Government
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____

(List additional personnel on reverse side)

IC Page 1

II.

Identify full compliance with procedures identified at preparatory.
Coordinate plans, specifications, and submittals.

Comments

III. Preliminary Work. Ensure preliminary work is complete and correct.
If not, what action is taken?

IV. Establish Level of Workmanship.

1. Where is work located?_____

2. Is a sample panel required? Yes _____ No _____

3. Will the initial work be considered as a sample?

Yes _____ No _____

(If yes, maintain in present condition as long as possible.)

V. Resolve any differences.

Comments

VI. Check Safety

Review job conditions using EM 385-1-1 and job hazard analysis.

Comments _____

CQC REP

IC Page 3

PIPING SYSTEM TEST REPORT

STRUCTURE OR BUILDING_____

CONTRACT NO. _____

DESCRIPTION OF SYSTEM OR PART OF SYSTEM TESTED: _____

DESCRIPTION OF TEST: _____

NAME AND TITLE OF PERSON IN CHARGE OF PERFORMING TESTS FOR CONTRACTOR:

NAME _____

TITLE _____

SIGNATURE _____

I HEREBY CERTIFY THAT THE ABOVE DESCRIBED SYSTEM HAS BEEN TESTED AS
INDICATED ABOVE AND FOUND TO BE ENTIRELY SATISFACTORY AS REQUIRED IN
THE CONTRACT SPECIFICATIONS.

SIGNATURE OF INSPECTOR _____

DATE _____

REMARKS: _____

CONTRACTOR'S INSPECTOR ROOFING CHECK LIST AND TEST REPORT
(For each day of roofing operations)

Date_____ Weather_____

Contract No._____

All data required to be taken from labels on container:

1. Type of bitumen used with underlayment or insulation and area covered

2. Type of bitumen used with base sheet and area covered_____

3. Type of bitumen used for mopping 4-plyes_____

4. Type of bitumen used for flood coat or surfacing gravel_____

5. Type of thickness of insulation or underlayment used_____

6. Type of base sheet used_____

7. Type of felt used_____

8. Source of surface gravel and condition, wet, dry, clean_____

9. Roofing sample(s), location and weight_____

10. Bitumen sample furnished to the Government, quantity and type_____

11. Bitumen temperature checks, type of asphalt, time taken, maximum
temperature specified_____

12. Are brooms being used? Yes_____ No_____

13. Bituminous cement used, type and usage_____

14. Area covered_____

Contractor's Approved Authorized
Representative_____
Quality Control Inspector

Roofing Checklist Page 1

[illegible]

Section 01451 Page 30

-- End of Section --

GOVERNMENT FIELD OFFICE
01/2003
AMENDMENT NO. 0002

1.1 REFERENCES

AIR CONDITIONING AND REFRIGERATION INSTITUTE (ARI)

ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IESNA)

INTERNATIONAL CODE COUNCIL (ICC)

1.2 SUBMITTALS

SD-03 Product Data

Government Field Office; G.

Provide manufacturer catalog data, specifications, and shop drawings for approval, verifying all dimensions, fixtures and equipment. Note all deviations on drawings.

2.1 GOVERNMENT FIELD OFFICE

Section 01520 Page 1

feet minimum), and a kitchen area. Provide a connecting door to each office from the conference room and each office/conference room shall have sufficient number of adjustable windows for adequate lighting and ventilation, and a battery-operated smoke detector alarm for each room. The conference room shall be situated in the middle portion of the Government Field Office. The Government Field Office shall be equipped with a water heater, overhead lighting in accordance with IESNA RP-1 standards, and have adequate air conditioning, heating, and potable water supply. The walls and ceiling of the project field office shall be insulated and the interior and exterior walls shall be of a prefinished material. The building shall be constructed of wood, metal or other acceptable construction materials and shall be designed in accordance with the ICC Building Code. The windows and doors shall be screened and the doors provided with dead bolt type locksets. Exterior door hinge pins shall be non-removable. The two exterior entrance doors shall be keyed alike and provided with 8 keys. The windows shall be openable and be securely fastened from the inside. Glass panels in windows shall be protected by bars or heavy mesh screens to prevent easy access to the building through these panels. In warm weather, air conditioning capable of maintaining the office at 50 percent relative humidity and a room temperature 20 degrees F below the outside temperature when the outside temperature is 95 degrees F, shall be furnished. If window-style air conditioner(s) is used, the refrigerant shall be one of the fluorocarbon gases that is in accordance with ARI 700 and has an Ozone Depletion Potential (ODP) of less than or equal to 0.05. Provide a mail slot in the main entrance door or a lockable mail box mounted on the surface of the main entrance door. If a lockable mail box is provided, then provide 8 keys. The Government Field Office shall have two (2) exterior entrance doors (one facing the contractors field office and the other one on the opposite site of the field office). No exterior entrance door shall be located having to enter or leave the government field office through the offices, file room, or toilet facilities. Each exterior entrance doors shall have covered entrances (6 feet x 6 feet minimum). The entrance door facing the contractors field office shall also have a covered walkway between the contractors field office and the governments field office. Both exterior entrances shall have a concrete walkway from the entrance to the parking lot to the west. Equip the field office with the following:

Conference Room:

- 10 conference tables with minimum 6 chairs per table
- Printer/Copier/Fax/Scan Combo (Xerox WorkCentre-Pro 55 or one with similar features and quality)
- Marker board 3 feet by 6 feet
- Wall mounted projection screen
- 2 (two) digital cameras (Kodak Easyshare CX7530 with software and Kodak Easyshare Camera Dock 6000 or one with similar features and quality)

File Room:

- 15 - 5 drawer heavy duty file cabinets (legal size)
- 24 inch wide; 10 foot long; 5 self, metal or wood selving to store design drawings and specifications

Design Review Office:

- 4 tables with minimum 6 chairs per table

Kitchen Area:

- microwave (1 cu. foot) and microwave stand
- refrigerator (10 cu. ft.)

- coffee maker (10 or 12 cup)
- water fountain with cooler
- sink with applicable plumbing (drain, cold and hot water, etc)

Each Office:

- desk with three drawers and middle drawer, 48 inches by 30 inches minimum work area.
- height adjustable swivel chair with arm rests, minimum
- stool for plans table
- plans rack for full size plans
- 5-drawer lockable file cabinet (legal size)
- small bookcase (approximately 40 inches tall, 30 inches wide, and 12 inches deep)
- marker board (approximately 3 feet by 2.5 feet)
- computer and software: Pentium 4, 2.66 GHz (minimum) computer, with 19 inch monitor, 512 megabytes RAM, 50GB (minimum) hard drive, compact disc reader/writer, 3.5 inch floppy drive, Windows XP Professional.

2.1.1 Manufacturer

Manufacturer shall be regularly engaged in the construction and on-site erection of relocatable modular buildings or trailers.

2.1.2 Utilities

Exterior utilities shall be permanently installed to the Government Field Office and connected with existing utilities. Exposed utilities shall be insulated to prevent freezing. Utilities shall be connected and disconnected in accordance with local codes and to the satisfaction of the Contracting Officer. Contractor shall be responsible for the cost of all utility usage except telephone. The contractor shall provide all telephone equipment, service to the Government Field Office from Bldg 4622 (CTAO), and all accessories necessary to make the telephone system a complete and usable system at the Government Field Office. The telephone system at the Government Field Office shall be an extension of Bldg 4622 Telephone System. Each office shall be equipt with a telephone outlet. The conference room shall be equipt with two (2) telephone outlets. One of the telephone outlets shall be situated by the printer/copier,scanner/fax combo data outlets for connection to the fax. The telephones provided shall be compatible with Bldg 4622 telephone system. The telephone in the conference room shall have the capability for speaker/conference calls. The Government Field Office shall also be equipt with speakers to page personnel over Bldg 4622 CTAO Telephone System.

Networking Requirements: The Contractor shall work with CESWF-IM and Fort Hood DOIM to meet all networking requirements. The Contractor shall provide all network switching hardware in and between both the Government Field Office and Bldg 4622 (CTAO) required for SWF LAN connectivity. The SWF LAN connectivity flows through Bldg 4632. The Contractor shall contact Ft. Hood DOIM contractor to arrange for them to terminate fiber in Bldg 4632, conduct splices, and connections at RSC Bldg. The Contractor shall be responsible for all costs absorbed by the Fort Hood DOIM contractor. The Contractor shall be responsible for providing fiber/cable from Bldg 4632 to the Government Field Office to obtain connectivity between Bldg 4622 (CTAO) and the Government Field Office. The Contractor shall be responsible for all costs associated with the SWF LAN connectivity between the Government Field Office and Bldg 4622 (CTAO) including but not limited to hardware, materials, labor, and equipment. Each office shall have a

data outlet to connect to the SWF LAN. The conference room shall have one (1) centered floor data outlet for briefings and two (2) adjacent wall mounted data outlets for connection to the printer/copier/scanner/fax combo. All cabling inside the Government Field Office shall be linked together to provide connectivity back to Bldg 4622 SWF LAN System.

2.1.3 Vehicular Access and Parking

The Contractor shall provide an improved parking area as shown on Sheet CA-1 of the drawings.

PART 3 EXECUTION

3.1 ERECTION

Erect the building in accordance with building manufacturer's written recommendations at a location designated by the Contracting Officer. Securely anchor the entire office to the ground to guard against movement during high winds (90 mph winds). Water and weather proof the unit and make ready for use within 10 days after Contract Notice to Proceed.

3.2 JANITORIAL SERVICES

Provide daily janitorial services, trash collection, and building maintenance during the life of the Contract.

3.3 MAINTENANCE AND REPAIR

The Contractor shall be responsible for maintenance and repair of the office during the life of the Contract.

3.4 RELOCATION

The Contractor shall be responsible for relocating the Government Field Office should it be required to accommodate the sequence of construction. The relocation will be at no expense to the Government.

3.5 OWNERSHIP AND DISPOSITION

The office, including all furniture and equipment, shall remain the property of the Contractor at completion of the construction. The Contractor shall remove the unit and all associated equipment and utilities after the Government vacates the office.

-- End of Section --

SECTION 01525

SAFETY AND OCCUPATIONAL HEALTH REQUIREMENTS

01/04

AMENDMENT NO. 0002

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

- | | |
|-------------|--|
| ANSI A92.6 | (1979) Self-Propelled Elevating Work Platforms |
| ANSI Z359.1 | (1992; R 1999) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components |

ASME INTERNATIONAL (ASME)

- | | |
|-------------|--|
| ASME B30.3 | (1996) Construction Tower Cranes |
| ASME B30.22 | (2000) Articulating Boom Cranes |
| ASME B30.5 | (2000) Mobile and Locomotive Cranes |
| ASME B30.8 | (2000) Floating Cranes and Floating Derricks |

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- | | |
|----------|---|
| NFPA 10 | (2002) Portable Fire Extinguishers |
| NFPA 241 | (2000) Safeguarding Construction, Alteration, and Demolition Operations |
| NFPA 51B | (2003) Fire Prevention During Welding, Cutting, and Other Hot Work |
| NFPA 70 | (2002) National Electrical Code |

U.S. ARMY CORPS OF ENGINEERS (USACE)

- | | |
|------------|---|
| EM 385-1-1 | (Current Version) Safety and Health Requirements Manual |
|------------|---|

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

- | | |
|-----------------|--|
| 29 CFR 1910 | Occupational Safety and Health Standards |
| 29 CFR 1910.146 | Permit-required Confined Spaces |

29 CFR 1910.94	Ventilation
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1919	Gear Certification
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.500	Fall Protection

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G

Activity Hazard Analysis (AHA); G

Crane Critical Lift Plan; G

Crane Work Plan; G

Proof of qualification for Crane Operators; G

Supporting Systems calculations;

SD-02 Shop Drawings

Temporary Support Data; G

Temporary support data, including shop drawings, product data, calculations, and certifications, for structural steel, concrete masonry units, and elevated concrete floors.

SD-06 Test Reports

Reports

Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."

Accident Reports

Monthly Exposure Reports

Regulatory Citations and Violations

Crane Reports

Doctor's Reports

1.3 DEFINITIONS

a. Competent Person for Fall Protection. A person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as their application and use with related equipment, and has the authority to take prompt corrective measures to eliminate the hazards of falling.

b. High Visibility Accident. Any mishap which may generate publicity and/or high visibility.

c. Low-slope roof. A roof having a slope less than or equal to 4 in 12 (vertical to horizontal).

d. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even though provided by a physician or registered personnel.

e. Multi-Employer Work Site (MEWS). A multi-employer work site, as defined by OSHA, is one in which many employers occupy the same site. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors.

f. Operating Envelope. The area surrounding any crane. Inside this "envelope" is the crane, the operator, riggers, rigging gear between the hook and the load, the load and the crane's supporting structure (ground, rail, etc.).

g. Qualified Person for Fall Protection. A person with a recognized degree or professional certificate, extensive knowledge, training and experience in the field of fall protection who is capable of performing design, analysis, and evaluation of fall protection systems and equipment.

h. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:

(1) Death, regardless of the time between the injury and death, or the length of the illness;

(2) Days away from work;

(3) Restricted work;

(4) Transfer to another job;

(5) Medical treatment beyond first aid;

(6) Loss of consciousness; or

(7) A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

i. Site Safety and Health Officer (SSHO). The superintendent or other qualified or competent person who is responsible for the on-site safety and health required for the project. The Contractor quality control (QC) person can be the SSHO on this project.

j. Steep roof. A roof having a slope greater than 4 in 12 (vertical to horizontal).

k. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.

1.4 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, work performed shall comply with USACE EM 385-1-1, and the following federal, state, and local, laws, ordinances, criteria, rules and regulations to include those of Texas. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.5 DRUG PREVENTION PROGRAM

Conduct a proactive drug and alcohol use prevention program for all workers, prime and subcontractor, on the site. Ensure that no employee uses illegal drugs or consumes alcohol during work hours. Ensure there are no employees under the influence of drugs or alcohol during work hours. After accidents, collect blood, urine, or saliva specimens and test the injured and involved employees for the influence of drugs and alcohol. A copy of the test shall be made available to the Contracting Officer upon request.

1.6 SITE QUALIFICATIONS, DUTIES AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

Site Safety and Health Officer (SSHO) shall be provided at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The SSHO shall meet the following requirements:

(AM#2) Level 4:

A minimum of 10 years safety work of a progressive nature with at least 5 years of experience on similar projects.

30-hour OSHA construction safety class or equivalent within the last 5 years.

An average of at least 24 hours of formal safety training each year for the past 5 years with training for competent person status for at least the following 4 areas of competency:

Excavation; Scaffolding; Fall protection; Hazardous energy; Confined space; Health hazard recognition, evaluation and control of chemical, physical and biological agents; Personal protective equipment and clothing to include selection, use and maintenance.]

~~(AM#2) Level 5:~~

~~An Associate Safety Professional (ASP), Certified Safety Trained~~

~~Supervisor (STS) and/or Construction Health & Safety Technician (CHST).~~

~~A minimum of 10 years safety work of a progressive nature with at least 5 years of experience on similar projects.~~

~~30 hour OSHA construction safety class or equivalent within the last 5 years.~~

~~An average of at least 24 hours of formal safety training each year for the past 5 years with training for competent person status for at least the following areas of competency: Excavation; Scaffolding; Fall protection; Hazardous energy; Confined space; Health hazard recognition, evaluation and control of chemical, physical and biological agents; and Personal protective equipment and clothing to include selection, use and maintenance.~~

1.6.1.2 Competent Person for Confined Space Entry

Provide a competent person meeting the requirements of EM 385-1-1 who is assigned in writing by the Designated Authority to assess confined spaces and who possesses demonstrated knowledge, skill and ability to:

- a. Identify the structure, location, and designation of confined and permit-required confined spaces where work is done;
- b. Calibrate and use testing equipment including but not limited to, oxygen indicators, combustible gas indicators, carbon monoxide indicators, and carbon dioxide indicators, and to interpret accurately the test results of that equipment;
- c. Perform all required tests and inspections specified in 29 CFR 1910.146 and 29 CFR 1915 Subpart B;
- d. Assess hazardous conditions including atmospheric hazards in confined space and adjacent spaces and specify the necessary protection and precautions to be taken;
- e. Determine ventilation requirements for confined space entries and operations;
- f. Assess hazards associated with hot work in confined and adjacent space and determine fire watch requirements; and,
- g. Maintain records required.

1.6.1.3 Crane Operators

Crane operators shall meet the requirements in USACE EM 385-1-1, Section 16 and Appendix G. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, crane operators shall be designated as qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Proof of current qualification shall be provided.

1.6.2 Personnel Duties

1.6.2.1 Site Safety and Health Officer (SSHO)/Superintendent

- a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection,

identified hazards, recommended corrective actions, estimated and actual dates of corrections. Safety inspection logs shall be attached to the Contractors' daily quality control report.

- b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.
- c. Maintain applicable safety reference material on the job site.
- d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.
- e. Implement and enforce accepted APPS and AHAs.
- f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. A list of unresolved safety and health deficiencies shall be posted on the safety bulletin board.
- g. Ensure sub-contractor compliance with safety and health requirements.

Failure to perform the above duties will result in dismissal of the superintendent and/or SSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

- a. The Contractor will be informed, in writing, of the date of the preconstruction conference. The purpose of the preconstruction conference is for the Contractor and the Contracting Officer's representatives to become acquainted and explain the functions and operating procedures of their respective organizations and to reach mutual understanding relative to the administration of the overall project's Accident Prevention Plan (APP) before the initiation of work.
- b. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).
- c. The Contractor shall discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, a schedule for the preparation, submittal, review, and acceptance of AHAs shall be established to preclude project delays.
- d. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor

shall revise the plan to correct deficiencies and re-submit it for acceptance. Work shall not begin until there is an accepted APP.

e. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

1.6.3.2 Weekly Safety Meetings

Conduct weekly safety meetings at the project site for all employees. The Contracting Officer will be informed of the meeting in advance and be allowed attendance. Minutes showing contract title, signatures of attendees and a list of topics discussed shall be attached to the Contractors' daily quality control report.

1.6.3.3 Work Phase Meetings

The appropriate AHA shall be reviewed and attendance documented by the Contractor at the preparatory, initial, and follow-up phases of quality control inspection. The analysis should be used during daily inspections to ensure the implementation and effectiveness of safety and health controls.

1.7 TRAINING

1.7.1 New Employee Indoctrination

New employees (prime and sub-contractor) will be informed of specific site hazards before they begin work. Documentation of this orientation shall be kept on file at the project site.

1.7.2 Periodic Training

Provide Safety and Health Training in accordance with USACE EM 385-1-1 and the accepted APP. Ensure all required training has been accomplished for all onsite employees.

1.7.3 Training on Activity Hazard Analysis (AHA)

Prior to beginning a new phase, training will be provided to all affected employees to include a review of the AHA to be implemented.

1.8 ACCIDENT PREVENTION PLAN (APP)

The Contractor shall use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Preparation of Accident Prevention Plan". Where a paragraph or subparagraph element is not applicable to the work to be performed indicate "Not Applicable" next to the heading. Specific requirements for some of the APP elements are described below at paragraph "EM 385-1-1 Contents". The APP shall be job-specific and shall address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Any portions of the Contractor's overall safety and health program referenced in the APP shall be included in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the

contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer and any designated CSP and/or CIH.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. The Contracting Officer reviews and comments on the Contractor's submitted APP and accepts it when it meets the requirements of the contract provisions.

Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and quality control manager. Should any unforeseen hazard become evident during the performance of work, the project superintendent shall inform the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, all necessary action shall be taken by the Contractor to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment.

Copies of the accepted plan will be maintained at the resident engineer's office and at the job site.

The APP shall be continuously reviewed and amended, as necessary, throughout the life of the contract. Unusual or high-hazard activities not identified in the original APP shall be incorporated in the plan as they are discovered.

1.8.1 EM 385-1-1 Contents

In addition to the requirements outlines in Appendix A of USACE EM 385-1-1, the following is required:

a. Names and qualifications (resumes including education, training, experience and certifications) of all site safety and health personnel designated to perform work on this project to include the designated site safety and health officer and other competent and qualified personnel to be used such as CSPs, CIHs, STSs, CHSTs. The duties of each position shall be specified.

b. Qualifications of competent and of qualified persons. As a minimum, competent persons shall be designated and qualifications submitted for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; personal protective equipment and clothing to include selection, use and maintenance.

c. Confined Space Entry Plan. Develop a confined space entry plan in accordance with USACE EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, and any other federal, state and local

regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

d. Health Hazard Control Program. The Contractor shall designate a competent and qualified person to establish and oversee a Health Hazard Control Program in accordance with USACE EM 385-1-1, Section 6. The program shall ensure that employees, on-site Government representatives, and others, are not adversely exposed to chemical, physical and biological agents and that necessary controls and protective actions are instituted to ensure health.

e. Crane Critical Lift Plan. Prepare and sign weight handling critical lift plans for lifts over 75 percent of the capacity of the crane or hoist (or lifts over 50 percent of the capacity of a barge mounted mobile crane's hoists) at any radius of lift; lifts involving more than one crane or hoist; lifts of personnel; and lifts involving non-routine rigging or operation, sensitive equipment, or unusual safety risks. The plan shall be submitted 15 calendar days prior to on-site work and include the requirements of USACE EM 385-1-1, paragraph 16.c.18. and the following:

- (1) For lifts of personnel, the plan shall demonstrate compliance with the requirements of 29 CFR 1926.550(g).

f. Alcohol and Drug Abuse Plan

- (1) Describe plan for random checks and testing with pre-employment screening in accordance with the DFAR Clause subpart 252.223-7004, "Drug Free Work Force."

- (2) Description of the on-site prevention program

g. Fall Protection and Prevention (FP&P) Plan. The plan shall be site specific and address all fall hazards in the work place and during different phases of construction. It shall address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 1.8 m (6 feet). A qualified person for fall protection shall prepare and sign the plan. The plan shall include fall protection and prevention systems, equipment and methods employed for every phase of work, responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Fall Protection and Prevention Plan shall be revised every six months for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. The accepted Fall Protection and Prevention Plan shall be kept and maintained at the job site for the duration of the project.

The Fall Protection and Prevention Plan shall be included in the Accident Prevention Plan (APP).

h. Training Records and Requirements. List of mandatory training and certifications which are applicable to this project (e.g. explosive actuated tools, confined space entry, fall protection, crane operation, vehicle operator, forklift operators, personal protective equipment);

list of requirements for periodic retraining/certification; outline requirements for supervisory and employee safety meetings.

j. Lead Compliance Plan. The safety and health aspects of lead work, prepared in accordance with Section 13282N LEAD IN CONSTRUCTION.

k. Asbestos Hazard Abatement Plan. The safety and health aspects of asbestos work, prepared in accordance with Section 13280A ASBESTOS ABATEMENT.

l. Not Used

m. Not Used

n. Site Demolition Plan. The safety and health aspects prepared in accordance with Section 02220 DEMOLITION and referenced sources.

o. Excavation Plan. The safety and health aspects prepared in accordance with Section 02300 EARTHWORK.

p. Crane Work Plan. The contractor shall provide a crane work plan to the Contracting Officer for acceptance. The crane work plan shall include the specific model of each crane and a drawing identifying their locations (exact), the dimensions, wheel sizes, number of wheels, wheel spacing, tire pressure(s), number of axles, axle spacing, minimum wheel load to be exerted during operations and maximum outrigger load to be exerted during operations. The Contractor shall allow at least 10 working days for acceptance/non-acceptance of the crane work plan. No crane operations shall begin prior to written acceptance of the crane work plan by the Government. AE/RE shall be the government approving authority.

1.9 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) format shall be in accordance with USACE EM 385-1-1. Submit the AHA for review at least 15 calendar days prior to the start of each phase. Format subsequent AHA as amendments to the APP. An AHA will be developed by the Contractor for every operation involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or subcontractor is to perform work. The analysis must identify and evaluate hazards and outline the proposed methods and techniques for the safe completion of each phase of work. At a minimum, define activity being performed, sequence of work, specific safety and health hazards anticipated, control measures (to include personal protective equipment) to eliminate or reduce each hazard to acceptable levels, equipment to be used, inspection requirements, training requirements for all involved, and the competent person in charge of that phase of work. For work with fall hazards, including fall hazards associated with scaffold erection and removal, identify the appropriate fall protection methods used. For work with materials handling equipment, address safeguarding measures related to materials handling equipment. For work requiring excavations, include requirements for safeguarding excavations. An activity requiring an AHA shall not proceed until the AHA has been accepted by the Contracting Officer's representative and a meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activity, including on-site Government representatives. The Contractor shall document meeting attendance at the preparatory, initial, and follow-up phases of quality control inspection. The AHA shall be continuously reviewed and, when appropriate, modified to address changing

site conditions or operations. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.

Activity hazard analyses shall be updated as necessary to provide an effective response to changing work conditions and activities. The on-site superintendent, site safety and health officer and competent persons used to develop the AHAs, including updates, shall sign and date the AHAs before they are implemented.

The activity hazard analyses shall be developed using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier or subcontractor and provided to the prime contractor for submittal to the Contracting Officer.

1.10 DISPLAY OF SAFETY INFORMATION

Within 2 calendar days after commencement of work, erect a safety bulletin board at the job site. The following information shall be displayed on the safety bulletin board in clear view of the on-site construction personnel, maintained current, and protected against the elements and unauthorized removal:

- a. Map denoting the route to the nearest emergency care facility.
- b. Emergency phone numbers.
- c. Copy of the most up-to-date APP.
- d. Current AHA(s).
- e. OSHA 300A Form.
- f. OSHA Safety and Health Protection-On-The-Job Poster.
- g. Confined space entry permit.
- h. Hot work permit.
- i. A sign indicating the number of hours worked since last lost workday accident.
- j. Safety and Health Warning Posters.

1.11 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in the article "References." Maintain applicable equipment manufacturer's manuals.

1.12 EMERGENCY MEDICAL TREATMENT

Contractors will arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.13 REPORTS

1.13.1 Accident Reports

a. For recordable injuries and illnesses, and property damage accidents resulting in at least \$2,000 in damages, the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the USACE Accident Report Form 3394 and provide the report to the Contracting Officer within 1 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.

1.13.2 Accident Notification

Notify the Contracting Officer as soon as practical, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than \$2,000, or any weight handling equipment accident. Information shall include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted.

1.13.3 Monthly Exposure Reports

Monthly exposure reporting to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

1.13.4 Regulatory Citations and Violations

Contact the Contracting Officer immediately of any OSHA or other regulatory agency inspection or visit, and provide the Contracting Officer with a copy of each citation, report, and contractor response. Correct violations and citations promptly and provide written corrective actions to the Contracting Officer.

1.13.5 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix H and as specified herein with Daily Reports of Inspections.

1.13.6 Doctor's Reports

The Contractor shall provide, in the event of any Contractor/subcontractor employee lost time injury accident, a doctor's report of examination which states the number of days that the physician recommends the employee recuperate before returning for work. This requirement shall be in addition to other reporting requirements and may, in specific instances, be waived by the Contracting Officer.

1.14 HOT WORK

Prior to performing "Hot Work" (welding, cutting, etc.) or operating other flame-producing/spark producing devices, a written permit shall be requested from the Fire Division. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. The Contractor will provide at least two (2) twenty (20) pound 4A:20 BC rated extinguishers for normal "Hot Work". All extinguishers shall be current inspection tagged, approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch shall be trained in accordance with NFPA 51B and remain on-site for a minimum of 30 minutes after completion of the task or as specified on the hot work permit.

a. Oil painting materials (paint, brushes, empty paint cans, etc.), and all flammable liquids shall be removed from the facility at quitting time. All painting materials and flammable liquids shall be stored outside in a suitable metal locker or box and will require re-submittal with non-hazardous materials.

b. Accumulation of trays, paper, shavings, sawdust, boxes and other packing materials shall be removed from the facility at the close of each workday and such material disposed of in the proper containers located away from the facility.

c. The storage of combustible supplies shall be a safe distance from structures.

d. Area outside the facility undergoing work shall be cleaned of trash, paper, or other discarded combustibles at the close of each workday.

e. All portable electric devices (saws, sanders, compressors, extension chord, lights, etc.) shall be disconnected at the close of each workday. When possible, the main electric switch in the facility shall be deactivated.

f. When starting work in the facility, Contractors shall require their personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Division phone number. ANY FIRE, NO MATTER HOW SMALL, SHALL BE REPORTED TO THE RESPONSIBLE FIRE DIVISION IMMEDIATELY.

1.15 LANGUAGE

For each work group that has employees who do not speak English, the Contractor shall provide a bilingual foreman who is fluent in English and in the language of the workers. The Contractor will implement the requirements of COE EM 385-1-1, paragraphs 01.B.01, 01.B.02, and 01.C.02 through these foremen.

PART 2 PRODUCTS

2.1 CONFINED SPACE SIGNAGE

The Contractor shall provide permanent signs integral to or securely attached to access covers for new permit-required confined spaces. Signs wording: "DANGER--PERMIT-REQUIRED CONFINED SPACE - DO NOT ENTER -" in bold

letters a minimum of 25 mm (one inch) in height and constructed to be clearly legible with all paint removed. The signal word "DANGER" shall be red and readable from 1.52 m (5 feet).

PART 3 EXECUTION

3.1 CONSTRUCTION AND/OR OTHER WORK

The Contractor shall comply with USACE EM 385-1-1, NFPA 241, the APP, the AHA, Federal and/or State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard shall prevail.

3.1.1 Hazardous Material Use

Each hazardous material must receive approval prior to being brought onto the job site or prior to any other use in connection with this Contract. Allow a minimum of 10 working days for processing of the request for use of a hazardous material. Any work or storage involving hazardous chemicals or materials must be done in a manner that will not expose Government or Contractor employees to any unsafe or unhealthful conditions. Adequate protective measures must be taken to prevent Government or Contractor employees from being exposed to any hazardous condition that could result from the work or storage. The Prime Contractor shall keep a complete inventory of hazardous materials brought onto the work-site. Approval by the Contracting Officer of protective measures and storage area is required prior to the start of the work.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with USACE EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials.

3.1.3 Unforeseen Hazardous Material

The design should have identified materials such as PCB, lead paint, and friable and non-friable asbestos. If additional material, not indicated, that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to "FAR 52.243-4, Changes" and "FAR 52.236-2, Differing Site Conditions."

3.2 PRE-OUTAGE COORDINATION MEETING

Contractors are required to apply for utility outages at least 15 days in advance unless otherwise specified in Section 01000 DESIGN AND CONSTRUCTION

SCHEDULE. As a minimum, the request should include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, the Contractor shall attend a pre-outage coordination meeting with the Contracting Officer and the Base Civil Engineering Office to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 FALL HAZARD PROTECTION AND PREVENTION PROGRAM

The Contractor shall establish a fall protection and prevention program, for the protection of all employees exposed to fall hazards. The program shall include company policy, identify responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and escape procedures.

3.3.1 Training

The Contractor shall institute a fall protection training program. As part of the Fall Hazard Protection and Prevention Program, the Contractor shall provide training for each employee who might be exposed to fall hazards. A competent person for fall protection shall provide the training. Training requirements shall be in accordance with USACE EM 385-1-1, section 21.A.16.

3.3.2 Fall Protection Equipment

The Contractor shall enforce use of the fall protection equipment designated for each specific work activity in the Fall Protection and Prevention Plan and/or AHA at all times when an employee is on a surface 1.8 m(6 feet) or more above lower levels. Fall protection systems such as guardrails, personnel fall arrest system, safety nets, etc., are required when working within 1.8m (6 feet) of any leading edge. In addition to the required fall protection systems, safety skiff, personal floatation devices, life rings etc., are required when working above or next to water in accordance with USACE EM 385-1-1, paragraphs 05.I. and 05.J. Personal fall arrest systems are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall arrest systems are required when operating other equipment such as scissor lifts if the work platform is capable of being positioned outside the wheelbase. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, or travel. Fall protection must comply with 29 CFR 1926.500, Subpart M and USACE EM 385-1-1.

3.3.2.1 Personal Fall Arrest Equipment

Personal fall arrest equipment, systems, subsystems, and components shall meet ANSI Z359.1. Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest device. Body belts may only be used as a positioning device system (for uses such as steel reinforcing assembly and in addition to an approved fall arrest system). Harnesses shall have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Only locking snap hooks and carabiners shall be used. Webbing, straps, and ropes shall be made of

synthetic fiber. The maximum free fall distance when using fall arrest equipment shall not exceed 1.8 m (6 feet). The total fall distance and any swinging of the worker (pendulum-like motion) that can occur during a fall shall always be taken into consideration when attaching a person to a fall arrest system.

3.3.3 Fall Protection for Roofing Work

Fall protection controls shall be implemented based on the type of roof being constructed and work being performed. The roof area to be accessed shall be evaluated for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

(1) For work within 1.8 m (6 feet) of an edge, on low-slope roofs, personnel shall be protected from falling by use of personal fall arrest systems, guardrails, or safety nets.

(2) For work greater than 1.8 m (6 feet) from an edge, warning lines shall be erected and installed in accordance with 29 CFR 1926.500 and USACE EM 385-1-1.

b. Steep Roofs: Work on steep roofs requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also includes residential or housing type construction.

3.3.4 Safety Nets

If safety nets are used as the selected fall protection system on the project, they shall be provided at unguarded work places, leading edge work or when working over water, machinery, dangerous operations or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, fall arrest systems or restraint/positioning systems are impractical. Safety nets shall be tested immediately after installation with a drop test of 181.4 kg (400 pounds) dropped from the same elevation a person might fall, and every six months thereafter.

3.3.5 Existing Anchorage

Existing anchorages, to be used for attachment of personal fall arrest equipment, shall be certified (or re-certified) by a qualified person for fall protection in accordance with ANSI Z359.1. Existing horizontal lifeline anchorages shall be certified (or re-certified) by a registered professional engineer with experience in designing horizontal lifeline systems.

3.3.6 Horizontal Lifelines

Horizontal lifelines shall be designed, installed, certified and used under the supervision of a qualified person for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500).

3.3.7 Guardrail Systems

Guardrails shall consist of top and mid-rails, post and toe boards. The top edge height of standard railing must be 42 inches plus or minus 3 inches above the walking/working level. When mid-rails are used, they must

be installed at a height midway between the top edge of the guardrail system and the walking/working level. Posts shall be placed no more than 8 feet apart (29 CFR 1926.500 and USACE EM 385-1-1).

3.3.8 Rescue and Evacuation Procedures

When personal fall arrest systems are used, the contractor must ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. A Rescue and Evacuation Plan shall be prepared by the contractor and include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. The Rescue and Evacuation Plan shall be included in the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP).

3.4 CONSTRUCTION/ERECTION SUPPORTS AND LOADS

3.4.1 Lateral Stability

The lateral stability of this structure is dependent on the total completion of all interconnected structural roof, wall, and floor framing/decking systems. The Contractor shall provide and adequately install and maintain all temporary supports such as temporary guys, lateral bracing, falsework, cribbing, and any other type structural supports required for a safe erection operation to maintain stability of the structure until all structural systems are interconnected as required by the contract plans and specifications.

3.4.2 Temporary Support Data

At least 60 days prior to the start of vertical construction and prior to the commencement of structural steel, concrete or masonry walls, elevated floors, and roofs, the Contractor shall submit detailed drawings, catalog data and calculations for all temporary supports as described in paragraph above, which will be used on this contract. These detailed drawings, catalog data, and calculations shall be prepared and certified by a Registered Structural Engineer. The minimum for vertical loads shall be actual dead loads plus a minimum live load of 25 psf, but use higher live loads if needed due to the Contractor's plan of erection. No load reductions will be allowed. Bracing shall be designed for a minimum wind load of 20 psf. Wind loadings will not be reduced from the design wind load provided and all temporary supports will be designed with a minimum safety factor of 1.5.

3.4.3 Installation And Maintenance

After approval of the temporary support system and calculations, the Contractor shall install and maintain the temporary structural support system in strict compliance with the approved drawings. Daily inspections will be conducted by the Contractor's Quality Control Inspector to assure all supports are installed as approved and properly maintained.

3.4.4 Architectural Or Structural Precast Or Tilt-Up Wall Panels

Temporary supports for architectural or structural precast or tilt-up wall panels will be designed as indicated above. Pipe or other approved bracing shall have lateral cross bracing between each pipe support. Tension guy

wires or cables will not be acceptable. Bolted or welded connections into the concrete floors and concrete wall panels will be designed with a safety factor of 3.0. Immediately after erecting each concrete wall panel, the bottom of the panel shall be secured by welding the weld plates or by bolting in place. Panels will not be temporarily placed in a vertical position until they are ready to be erected in their final position. If possible, all structural steel will be erected prior to erection of wall panels. If not, the structural steel will be commenced immediately after the last wall panel is set in the smallest section/bay possible. The Contractor shall not start a new wall section/bay until the structural steel is completed in the last section/bay.

3.5 SCAFFOLDING

Employees shall be provided with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Access to scaffold platforms greater than 6 m (20 feet) in height shall be accessed by use of a scaffold stair system. Vertical ladders commonly provided by scaffold system manufacturers shall not be used for accessing scaffold platforms greater than 6 m (20 feet) in height. The use of an adequate gate is required. Contractor shall ensure that employees are qualified to perform scaffold erection and dismantling. Do not use scaffold without the capability of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward. Special care shall be given to ensure scaffold systems are not overloaded. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material is prohibited. The first tie-in shall be at the height equal to 4 times the width of the smallest dimension of the scaffold base. Work platforms shall be placed on mud sills. Scaffold or work platform erectors shall have fall protection during the erection and dismantling of scaffolding or work platforms that are more than six feet. Delineate fall protection requirements when working above six feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.6 EQUIPMENT

3.6.1 Material Handling Equipment

- a. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.
- b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.
- c. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

3.6.2 Weight Handling Equipment

- a. Not Used.
- b. The Contractor shall notify the Contracting Officer 15 days in

advance of any cranes entering the activity so that necessary quality assurance spot checks can be coordinated. Contractor's operator shall remain with the crane during the spot check.

c. The Contractor shall comply with the crane manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Erection shall be performed under the supervision of a designated person (as defined in ASME B30.5). All testing shall be performed in accordance with the manufacturer's recommended procedures.

d. The Contractor shall comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, and ASME B30.8 for floating cranes and floating derricks.

e. The presence of Government personnel does not relieve the Contractor of an obligation to comply with all applicable safety regulations. The Government will investigate all complaints of unsafe or unhealthful working conditions received in writing from contractor employees, federal civilian employees, or military personnel.

f. Each load shall be rigged/attached independently to the hook/master-link in such a fashion that the load cannot slide or otherwise become detached. Christmas-tree lifting (multiple rigged materials) is not allowed.

g. Under no circumstance shall a Contractor make a lift at or above 90% of the cranes rated capacity in any configuration.

h. When operating in the vicinity of overhead transmission lines, operators and riggers shall be alert to this special hazard and shall follow the requirements of USACE EM 385-1-1 section 11 and ASME B30.5 or ASME B30.22 as applicable.

i. Crane suspended personnel work platforms (baskets) shall not be used unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Personnel shall not be lifted with a line hoist or friction crane.

j. A fire extinguisher having a minimum rating of 10BC and a minimum nominal capacity of 5lb of extinguishing agent shall be available at all operator stations or crane cabs. Portable fire extinguishers shall be inspected, maintained, and recharged as specified in NFPA 10, Standard for Portable Fire Extinguishers.

k. All employees shall be kept clear of loads about to be lifted and of suspended loads.

l. A weight handling equipment operator shall not leave his position at the controls while a load is suspended.

m. The Contractor shall use cribbing when performing lifts on outriggers.

n. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

- o. A physical barricade must be positioned to prevent personnel from entering the counterweight swing (tail swing) area of the crane.
- p. A substantial and durable rating chart containing legible letters and figures shall be provided with each crane and securely mounted onto the crane cab in a location allowing easy reading by the operator while seated in the control station.
- q. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected shall always be available for review by Contracting Officer personnel.
- r. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane shall be available for review by Contracting Officer personnel.
- s. The Contractor shall certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

3.6.3 Equipment and Mechanized Equipment

- a. Equipment shall be operated by designated qualified operators. Proof of qualifications shall be kept on the project site for review.
- b. Manufacture specifications or owner's manual for the equipment shall be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Such additional safety precautions or requirements shall be incorporated into the AHAs.
- c. Equipment and mechanized equipment shall be inspected in accordance with manufacturer's recommendations for safe operation by a competent person prior to being placed into use.
- d. Daily checks or tests shall be conducted and documented on equipment and mechanized equipment by designated competent persons.
- e. Rollover Protective Structures (ROPS): ROPS for rollers and compactors shall be certified to meet SAE requirement J1040C.
- f. Pulverizers: ROPS, as required by COE EM 385-1-1, paragraph 16.B.12, includes self-propelled pulverizers.
- g. Self-Propelled Elevating Work Platforms: All self-propelled elevating work platforms will be designed, constructed, maintained, used, and operated in accordance with the guidance provided in American National Standard for Self-Propelled Elevating Work Platforms (ANSI A92.6-1979) together with any amendments which may be in force at time contract is awarded.
- h. Radiation Permits or Authorizations: Contractors contemplating the use of radioactive materials or radiation producing equipment while performing work on this Contract shall obtain written authorization from the Department of the Army or Department of the Air Force, as applicable.

- (1) A 45-day lead time should be programmed for obtaining this

written authorization.

(2) When requested, the Contracting Officer's Authorized Representative will assist Contractor in obtaining the required permit or authorization.

i. Telephone: Provide an accessible telephone or equivalent means to immediately initiate emergency response services at the job site at all times while work is underway.

3.5.3 Supporting Systems

To COE EM 385-1-1, 23.D.01, add "Supporting systems, i.e., piling, cribbing, shoring, etc., shall be designed by a qualified person to meet accepted engineering requirements. Submit supporting systems construction details and design calculations, which bear the seal of a licensed professional engineer, for Contracting Officer review."

3.7 EXCAVATIONS

The competent person for excavations performed as a result of contract work shall be on-site when excavation work is being performed, and shall inspect, and document the excavations daily prior to entry by workers. The competent person must evaluate all hazards, including atmospheric, that may be associated with the work, and shall have the resources necessary to correct hazards promptly. The competent person shall perform soil classification in accordance with 29 CFR 1926.

3.7.1 Utility Locations

Prior to digging, the appropriate digging permit must be obtained. All underground utilities in the work area must be positively identified by a private utility locating service in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract.

3.7.2 Utility Location Verification

The Contractor must physically verify underground utility locations by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system. Digging within 0.061 m (2 feet) of a known utility must not be performed by means of mechanical equipment; hand digging shall be used. If construction is parallel to an existing utility the utility shall be exposed by hand digging every 30.5 m (100 feet) if parallel within 1.5 m (5 feet) of the excavation.

3.7.3 Utilities with Concrete Slabs

Utilities located within concrete slabs or pier decks, bridges, and the like are extremely difficult to identify. The location must be coordinated with station utility departments in addition to a private locating service. Outages on system utilities shall be used in circumstances where concrete chipping, saw cutting, or core drilling is required and utilities are unable to be completely identified.

3.7.4 Shoring Systems

Trench and shoring systems must be identified in the accepted safety plan and AHA. Manufacture tabulated data and specifications or registered engineer tabulated data for shoring or benching systems shall be readily available on-site for review. Job-made shoring or shielding shall have the registered professional engineer stamp, specifications, and tabulated data.

Extreme care must be used when excavating near direct burial electric underground cables.

3.7.5 Trenching Machinery

Trenching machines with digging chain drives shall be operated only when the spotters/laborers are in plain view of the operator. Operator and spotters/laborers shall be provided training on the hazards of the digging chain drives with emphasis on the distance that needs to be maintained when the digging chain is operating. Documentation of the training shall be kept on file at the project site.

3.8 ELECTRICAL

3.8.1 Conduct of Electrical Work

Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Positive cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the Contracting Officer and Station Utilities for identification. The Contracting Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers shall be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. In addition, provide electrical arc flash protection for personnel as required. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA.

3.8.1.1 De-Energizing Lines And Equipment

Upon request by the Contractor, arrangements will be made for de-energizing lines and equipment so that work may be performed. All outages shall be requested through the authorized representative of the Contracting Officer a minimum of 21 days, unless otherwise specified, prior to the beginning of the requested outages. Dates and duration will be specified.

3.8.1.2 Work Performed On Energized Lines

Upon approval of the Contracting Officer's representative, the following work may be performed with the lines energized using certified hot line

equipment, on lines above 600 volts, when the following conditions have been met:

- a. Work below the conductors no closer than the clearance required in COE EM 385-1-1 from the energized conductors.
- b. Setting and connection of new pretrimmed poles in energized lines which do not replace an existing pole.
- c. Setting and removing transformers or other equipment on poles.
- d. Installation or removal of hot line connectors, jumpers, dead-end insulators for temporary isolation, etc., which are accomplished with hot line equipment from an insulated bucket truck.

3.8.1.3 Work Plan for Energized Lines

The Contractor shall submit a plan, in writing, describing his method of operation and the equipment to be used on energized lines. Proper certification from an approved source of the safe condition of all tools and equipment will be provided with the plan. The work will be planned and scheduled so that proper supervision is maintained. The Contractor will review his plan with the Contracting Officer's representative prior to being granted permission to perform the work.

3.8.1.4 Lines Greater Than 600 Volts

No work on lines greater than 600 volts will be performed from the pole or without the use of an insulated bucket truck.

3.8.1.5 Overbuilt Lines

No work will be done on overbuilt lines while underbuilt lines are energized, except for temporary isolation and switching in accordance with subparagraph "Work Performed On Energized Lines" hereinbefore.

3.8.2 Portable Extension Cords

Portable extension cords shall be sized in accordance with manufacturer ratings for the tool to be powered and protected from damage. All damaged extension cords shall be immediately removed from service. Portable extension cords shall meet the requirements of NFPA 70.

3.9 WORK IN CONFINED SPACES

The Contractor shall comply with the requirements in Section 06.I of USACE EM 385-1-1 and OSHA 29 CFR 1910.146. Any potential for a hazard in the confined space requires a permit system to be used.

- a. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 06.I.05 of USACE EM 385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.
- b. Forced air ventilation is required for all confined space entry

operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its' action level.

c. Ensure the use of rescue and retrieval devices in confined spaces greater than 1.5 m (5 feet) in depth. Conform to Sections 06.I.09, 06.I.10 and 06.I.11 of USACE EM 385-1-1.

d. Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

e. Include training information for employees who will be involved as entrants and attendants for the work. Conform to Section 06.I.06 of USACE EM 385-1-1.

f. Daily Entry Permit. Post the permit in a conspicuous place close to the confined space entrance.

3.10 CRYSTALLINE SILICA

Grinding, abrasive blasting, and foundry operations of construction materials containing crystalline silica, shall comply with OSHA regulations, such as 29 CFR 1910.94, and USACE EM 385-1-1, Appendix C. The Contractor shall develop and implement effective exposure control and elimination procedures to include dust control systems, engineering controls, and establishment of work area boundaries, as well as medical surveillance, training, air monitoring, and personal protective equipment.

3.11 HOUSEKEEPING

3.11.1 Clean-Up

All debris in work areas shall be cleaned up daily or more frequently if necessary. Construction debris may be temporarily located in an approved location, however garbage accumulation must be removed each day.

3.11.2 Falling Object Protection

All areas must be barricaded to safeguard employees. When working overhead, Barricade the area below to prevent entry by unauthorized employees. Construction warning tape and signs shall be posted so they are clearly visible from all possible access points. When employees are working overhead all tools and equipment shall be secured so that they will not fall. When using guardrail as falling object protection, all openings shall be small enough to prevent passage of potential falling objects.

-- End of Section --

SECTION 13280A

ASBESTOS ABATEMENT
AMENDMENT NO. 0002

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

- | | |
|------------|---|
| ANSI Z87.1 | (2003) Practice for Occupational and Educational Eye and Face Protection |
| ANSI Z88.2 | (1992) Respiratory Protection |
| ANSI Z9.2 | (2001) Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems |

ASTM INTERNATIONAL (ASTM)

- | | |
|-------------|--|
| ASTM C 732 | (2001) Aging Effects of Artificial Weathering on Latex Sealants |
| ASTM D 1331 | (1989; R 2001) Surface and Interfacial Tension of Solutions of Surface-Active Agents |
| ASTM D 2794 | (1993; R 1999e1) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact) |
| ASTM D 4397 | (2002) Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications |
| ASTM D 522 | (1993a; R 2001) Mandrel Bend Test of Attached Organic Coatings |
| ASTM E 119 | (2000a) Fire Tests of Building Construction and Materials |
| ASTM E 1368 | (2002) Visual Inspection of Asbestos Abatement Projects |
| ASTM E 736 | (2000) Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members |
| ASTM E 84 | (2003) Surface Burning Characteristics of Building Materials |

ASTM E 96 (2000e1) Water Vapor Transmission of
Materials

COMPRESSED GAS ASSOCIATION (CGA)

CGA G-7 (2003) Compressed Air for Human Respiration

CGA G-7.1 (1997) Commodity Specification for Air

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 701 (1999) Fire Tests for Flame Propagation of
Textiles and Films

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 84-100 (1984; 3rd Ed, R: 1994) NIOSH Manual of
Analytical Methods

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (1996) Safety and Health Requirements
Manual

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 340/1-90/018 (1990) Asbestos/NESHAP Regulated Asbestos
Containing Materials Guidance

EPA 340/1-90/019 (1990) Asbestos/NESHAP Adequately Wet
Guidance

EPA 560/5-85-024 (1985) Guidance for Controlling
Asbestos-Containing Materials in Buildings
(Purple Book)

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910 Occupational Safety and Health Standards

29 CFR 1926 Safety and Health Regulations for
Construction

40 CFR 61 National Emission Standards for Hazardous
Air Pollutants

40 CFR 763 Asbestos

42 CFR 84 Approval of Respiratory Protective Devices

49 CFR 107 Hazardous Materials Program Procedures

49 CFR 171 General Information, Regulations, and
Definitions

49 CFR 172 Hazardous Materials Table, Special
Provisions, Hazardous Materials
Communications, Emergency Response
Information, and Training Requirements

49 CFR 173

Shippers - General Requirements for
Shipments and Packagings

UNDERWRITERS LABORATORIES (UL)

UL 586

(1996; Rev thru Apr 2000) High-Efficiency,
Particulate, Air Filter Units

1.2 DEFINITIONS

- a. Adequately Wet: A term defined in 40 CFR 61, Subpart M, and EPA 340/1-90/019 meaning to sufficiently mix or penetrate with liquid to prevent the release of particulate. If visible emissions are observed coming from asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.
- b. Aggressive Method: Removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles, or disintegrates intact asbestos-containing material (ACM).
- c. Amended Water: Water containing a wetting agent or surfactant with a surface tension of at least 29 dynes per square centimeter when tested in accordance with ASTM D 1331.
- d. Asbestos: Asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated and/or altered.
- e. Asbestos-Containing Material (ACM): Any materials containing more than one percent asbestos.
- f. Asbestos Fiber: A particulate form of asbestos, 5 micrometers or longer, with a length-to-width ratio of at least 3 to 1.
- g. Authorized Person: Any person authorized by the Contractor and required by work duties to be present in the regulated areas.
- h. Building Inspector: Individual who inspects buildings for asbestos and has EPA Model Accreditation Plan (MAP) "Building Inspector" training; accreditation required by 40 CFR 763, Subpart E, Appendix C.
- i. Certified Industrial Hygienist (CIH): An Industrial Hygienist certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.
- j. Class I Asbestos Work: Activities defined by OSHA involving the removal of thermal system insulation (TSI) and surfacing ACM.
- k. Class II Asbestos Work: Activities defined by OSHA involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos - containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic. Certain

"incidental" roofing materials such as mastic, flashing and cements when they are still intact are excluded from Class II asbestos work. Removal of small amounts of these materials which would fit into a glovebag may be classified as a Class III job.

- l. Class III Asbestos Work: Activities defined by OSHA that involve repair and maintenance operations, where ACM, including TSI and surfacing ACM, is likely to be disturbed. Operations may include drilling, abrading, cutting a hole, cable pulling, crawling through tunnels or attics and spaces above the ceiling, where asbestos is actively disturbed or asbestos-containing debris is actively disturbed.
- m. Class IV Asbestos Work: Maintenance and custodial construction activities during which employees contact but do not disturb ACM and activities to clean-up dust, waste and debris resulting from Class I, II, and III activities. This may include dusting surfaces where ACM waste and debris and accompanying dust exists and cleaning up loose ACM debris from TSI or surfacing ACM following construction.
- n. Clean room: An uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.
- o. Competent Person: In addition to the definition in 29 CFR 1926, Section .32(f), a person who is capable of identifying existing asbestos hazards as defined in 29 CFR 1926, Section .1101, selecting the appropriate control strategy, has the authority to take prompt corrective measures to eliminate them and has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training; accreditation required by 40 CFR 763, Subpart E, Appendix C.
- p. Contractor/Supervisor: Individual who supervises asbestos abatement work and has EPA Model Accreditation Plan "Contractor/Supervisor" training; accreditation required by 40 CFR 763, Subpart E, Appendix C.
- q. Critical Barrier: One or more layers of plastic sealed over all openings into a regulated area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a regulated area from migrating to an adjacent area.
- r. Decontamination Area: An enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.
- s. Demolition: The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.
- t. Disposal Bag: A 6 mil thick, leak-tight plastic bag, pre-labeled in accordance with 29 CFR 1926, Section .1101, used for transporting asbestos waste from containment to disposal site.
- u. Disturbance: Activities that disrupt the matrix of ACM, crumble or pulverize ACM, or generate visible debris from ACM.

Disturbance includes cutting away small amounts of ACM, no greater than the amount which can be contained in 1 standard sized glovebag or waste bag, not larger than 60 inches in length and width in order to access a building component.

- v. Equipment Room or Area: An area adjacent to the regulated area used for the decontamination of employees and their equipment.
- w. Employee Exposure: That exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.
- x. Fiber: A fibrous particulate, 5 micrometers or longer, with a length to width ratio of at least 3 to 1.
- y. Friable ACM: A term defined in 40 CFR 61, Subpart M and EPA 340/1-90/018 meaning any material which contains more than 1 percent asbestos, as determined using the method specified in 40 CFR 763, Subpart E, Appendix A, Section 1, Polarized Light Microscopy (PLM), that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than 10 percent, as determined by a method other than point counting by PLM, the asbestos content is verified by point counting using PLM.
- z. Glovebag: Not more than a 60 by 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.
- aa. High-Efficiency Particulate Air (HEPA) Filter: A filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.
- bb. Homogeneous Area: An area of surfacing material or thermal system insulation that is uniform in color and texture.
- cc. Industrial Hygienist: A professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards.
- dd. Intact: ACM which has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix. Removal of "intact" asphaltic, resinous, cementitious products does not render the ACM non-intact simply by being separated into smaller pieces.
- ee. Model Accreditation Plan (MAP): USEPA training accreditation requirements for persons who work with asbestos as specified in 40 CFR 763, Subpart E, Appendix C.
- ff. Modification: A changed or altered procedure, material or component of a control system, which replaces a procedure, material or component of a required system.
- gg. Negative Exposure Assessment: A demonstration by the Contractor to show that employee exposure during an operation is expected to be consistently below the OSHA Permissible Exposure Limits (PELs).

- hh. NESHAP: National Emission Standards for Hazardous Air Pollutants. The USEPA NESHAP regulation for asbestos is at 40 CFR 61, Subpart M.
- ii. Nonfriable ACM: A NESHAP term defined in 40 CFR 61, Subpart M and EPA 340/1-90/018 meaning any material containing more than 1 percent asbestos, as determined using the method specified in 40 CFR 763, Subpart E, Appendix A, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.
- jj. Nonfriable ACM (Category I): A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90/018 meaning asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy.
- kk. Nonfriable ACM (Category II): A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90/018 meaning any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos, as determined using the methods specified in 40 CFR 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
- ll. Permissible Exposure Limits (PELs):
- (1) PEL-Time weighted average(TWA): Concentration of asbestos not in excess of 0.1 fibers per cubic centimeter of air (f/cc) as an 8 hour time weighted average (TWA), as determined by the method prescribed in 29 CFR 1926, Section .1101, Appendix A, or the current version of NIOSH 84-100 analytical method 7400.
- (2) PEL-Excursion Limit: An airborne concentration of asbestos not in excess of 1.0 f/cc of air as averaged over a sampling period of 30 minutes as determined by the method prescribed in 29 CFR 1926, Section .1101, Appendix A, or the current version of NIOSH 84-100 analytical method 7400.
- mm. Regulated Area: An OSHA term defined in 29 CFR 1926, Section .1101 meaning an area established by the Contractor to demarcate areas where Class I, II, and III asbestos work is conducted; also any adjoining area where debris and waste from such asbestos work accumulate; and an area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limit.
- nn. Removal: All operations where ACM is taken out or stripped from structures or substrates, and includes demolition operations.
- oo. Repair: Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM attached to structures or substrates. If the amount of asbestos so "disturbed" cannot be contained in 1 standard glovebag or waste bag, Class I precautions are required.
- pp. Spills/Emergency Cleanups: Cleanup of sizable amounts of

asbestos waste and debris which has occurred, for example, when water damage occurs in a building, and sizable amounts of ACM are dislodged. A Competent Person evaluates the site and ACM to be handled, and based on the type, condition and extent of the dislodged material, classifies the cleanup as Class I, II, or III.

Only if the material was intact and the cleanup involves mere contact of ACM, rather than disturbance, could there be a Class IV classification.

qq. Surfacing ACM: Asbestos-containing material which contains more than 1% asbestos and is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

rr. Thermal system insulation (TSI) ACM: ACM which contains more than 1% asbestos and is applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain or water condensation.

ss. Transite: A generic name for asbestos cement wallboard and pipe.

tt. Worker: Individual (not designated as the Competent Person or a supervisor) who performs asbestos work and has completed asbestos worker training required by 29 CFR 1926, Section .1101, to include EPA Model Accreditation Plan (MAP) "Worker" training; accreditation required by 40 CFR 763, Subpart E, Appendix C, if required by the OSHA Class of work to be performed or by the state where the work is to be performed.

1.3 DESCRIPTION OF WORK

The work covered by this section includes the removal of asbestos-containing materials (ACM) which are encountered during (AM 0002) building renovation (AM 0002), building demolition -activities and site demolition associated with this project. Asbestos quantities are provided as attachment to SECTION 01010. (AM 0002) The Contractor shall verify all ACM abatement quantities at the renovated or demolished structures, and the demolition site with the COR. If asbestos cement pipes are encountered during site demolition, the Contractor shall (AM 0002) verify quantities with the Contracting Officer Representative~~stop work and notify~~. There are eight (8) structures to be demolished. These structures have wood floors beneath the floor tiles and mastic. There is an intermediate layer of tar with presumed ACM oxychloride floor surfacing on top of the wood floor and beneath the tiles and mastic. The tiles with mastic, the intermediate material layer, and the wood floor shall be abated as regulated ACM. The Contractor shall perform environmental and worker exposure assessment per SECTION 13280 ASBESTOS ABATEMENT and EP 1110-1-23 ASBESTOS ABATEMENT AIR MONITORING STANDARD SCOPE OF WORK. The Engineering Phamphets (EP) are available in the Engineering Phamphets folder EP 1110-X, in the UASCE folder of the web address <http://synectics.net/resources/>. This section describes procedures and equipment required to protect workers and occupants of the regulated area from contact with airborne asbestos fibers and ACM dust and debris. Activities include OSHA Class II work operations involving ACM. The work also includes containment, storage, transportation and disposal of the generated ACM wastes to Fort Hood Sanitary Landfill. No OSHA Class I work is anticipated. If Class I work is encountered, the Contractor shall stop work immediately and notify the Contracting Officer Representative immediately. The Contractor shall address the specific

operational procedures in the required submittals, i.e. Accident Prevention Plan and its subcomponents, the Asbestos Hazard Abatement Plan and Activity Hazard Analyses, paragraph SAFETY AND HEALTH PROGRAM AND PLANS. The Contractor shall walk through each building to verify quantities prior to abatement work and use TABLE 1, Work Task Data Element, at the end of this section, to document quantities with the COR. All submittal required in this section shall be submitted during initial design submittals after contract award. **A 10-day pre-work Notification for building renovation to Texas Department of Health is required and the Contractor shall plan this activity and not to affect the renovation schedule.** Renovation/Demolition Notification form is on the website,
<http://www.tdh.texas.gov/beh/asbestos/1298newform.doc>

1.3.1 Abatement Work Tasks

The specific ACM to be abated is identified on SECTION 01010. The appropriate RESPONSE ACTION DETAIL SHEET (item to be abated and methods to be used) and SET-UP DETAIL SHEETS (containment techniques to include safety precautions and methods) is in the U.S. Army Corps of Engineers, Engineering Pamphlet, EP 1110-1-11 ASBESTOS ABATEMENT GUIDELINE DETAIL SHEETS, dated July 1992). It is available on
<http://www.hnd.usace.army.mil/techinfo/engpubs.htm>

1.3.2 Unexpected Discovery of Asbestos

For any previously untested building components suspected to contain asbestos and located in areas impacted by the work, the Contractor shall notify the Contracting Officer (CO) who will have the option of ordering up to 30 bulk samples to be obtained at the Contractor's expense and delivered to a laboratory accredited under the National Institute of Standards and Technology (NIST) "National Voluntary Laboratory Accreditation Program (NVLAP)" and analyzed by PLM at no additional cost to the Government. Any additional components identified as ACM that have been approved by the Contracting Officer for removal shall be removed by the Contractor and will be paid for by an equitable adjustment to the contract price under the CONTRACT CLAUSE titled "changes". Sampling activities undertaken to determine the presence of additional ACM shall be conducted by personnel who have successfully completed the EPA Model Accreditation Plan (MAP) "Building Inspector" training course required by 40 CFR 763, Subpart E, Appendix C.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Respiratory Protection Program; G

Records of the respirator program.

Cleanup and Disposal; G

Waste shipment records. Weigh bills and delivery tickets shall be furnished for information only.

Detailed Drawings; G

Descriptions, detail project drawings, and site layout to include worksite containment area techniques as prescribed on applicable SET-UP DETAIL SHEETS, local exhaust ventilation system locations, decontamination units and load-out units, other temporary waste storage facility, access tunnels, location of temporary utilities (electrical, water, sewer) and boundaries of each regulated area.

Materials and Equipment;

Manufacturer's catalog data for all materials and equipment to be used in the work, including brand name, model, capacity, performance characteristics and any other pertinent information. Test results and certificates from the manufacturer of encapsulants substantiating compliance with performance requirements of this specification. Material Safety Data Sheets for all chemicals to be used onsite in the same format as implemented in the Contractor's HAZARD COMMUNICATION PROGRAM. Data shall include, but shall not be limited to, the following items:

- a. High Efficiency Filtered Air (HEPA) local exhaust equipment
- b. Vacuum cleaning equipment
- c. Pressure differential monitor for HEPA local exhaust equipment
- d. Air monitoring equipment
- e. Respirators
- f. Personal protective clothing and equipment
 - (1) Coveralls
 - (2) Underclothing
 - (3) Other work clothing
 - (4) Foot coverings
 - (5) Hard hats
 - (6) Eye protection
 - (7) Other items required and approved by Contractors Designated IH and Competent Person
- g. Glovebag
- h. Duct Tape
- i. Disposal Containers
 - (1) Disposal bags
 - (2) Fiberboard drums
 - (3) Paperboard boxes
- j. Sheet Plastic
 - (1) Polyethylene Sheet - General

- (2) Polyethylene Sheet - Flame Resistant
- (3) Polyethylene Sheet - Reinforced

k. Wetting Agent

- (1) Amended Water
- (2) Removal encapsulant

l. Strippable Coating

m. Prefabricated Decontamination Unit

n. Other items

o. Chemical encapsulant

p. Chemical encasement materials

q. Material Safety Data Sheets (for all chemicals proposed)

Qualifications; G

A written report providing evidence of qualifications for personnel, facilities and equipment assigned to the work.

Training Program;

A copy of the written project site-specific training material as indicated in 29 CFR 1926, Section .1101 that will be used to train onsite employees. The training document shall be signed by the Contractor's Designated IH and Competent Person.

Medical Requirements;

Physician's written opinion.

Encapsulants; G

Certificates stating that encapsulants meet the applicable specified performance requirements.

SD-06 Test Reports

Exposure Assessment and Air Monitoring; G

Initial exposure assessments, negative exposure assessments, air-monitoring results and documentation.

Local Exhaust Ventilation;

Pressure differential recordings.

Licenses, Permits and Notifications;

Licenses, permits, and notifications.

SD-07 Certificates

Vacuum, Filtration and Ventilation Equipment;

Manufacturer's certifications showing compliance with ANSI Z9.2 for:

- a. Vacuums.
- b. Water filtration equipment.
- c. Ventilation equipment.
- d. Other equipment required to contain airborne asbestos fibers.

1.5 QUALIFICATIONS

1.5.1 Written Qualifications and Organization Report

The Contractor shall furnish a written qualifications and organization report providing evidence of qualifications of the Contractor, Contractor's Project Supervisor, Designated Competent Person, supervisors and workers; third party independent Designated IH (person assigned to project and firm name); third party independent testing laboratory (including name of firm, principal, and analysts who will perform analyses); all subcontractors to be used including disposal transportation and disposal facility firms, subcontractor supervisors, subcontractor workers; and any others assigned to perform asbestos abatement and support activities. The report shall include an organization chart showing the Contractor's staff organization for this project by name and title, chain of command and reporting relationship with all subcontractors. The report shall be signed by the Contractor, the Contractor's onsite project manager, Designated Competent Person, Designated IH, designated testing laboratory and the principals of all subcontractors to be used. The Contractor shall include the following statement in the report: "By signing this report I certify that the personnel I am responsible for during the course of this project fully understand the contents of 29 CFR 1926, Section .1101, 40 CFR 61, Subpart M, and the federal, state and local requirements specified in paragraph SAFETY AND HEALTH PROGRAM AND PLANS for those asbestos abatement activities that they will be involved in."

1.5.2 Specific Requirements

The Contractor shall designate in writing, personnel meeting the following qualifications:

- a. Designated Competent Person: The name, address, telephone number, and resume of the Contractor's Designated Competent Person shall be provided. Evidence that the full-time Designated Competent Person is qualified in accordance with 29 CFR 1926, Sections .32 and .1101, has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C, and is experienced in the administration and supervision of asbestos abatement projects, including exposure assessment and monitoring, work practices, abatement methods, protective measures for personnel, setting up and inspecting asbestos abatement work areas, evaluating the integrity of containment barriers, placement and operation of local exhaust systems, ACM generated waste containment and disposal procedures, decontamination units installation and maintenance requirements, site safety and health requirements, notification of other employees onsite, etc. The duties of the

Competent Person shall include the following: controlling entry to and exit from the regulated area; supervising any employee exposure monitoring required by 29 CFR 1926, Section .1101; ensuring that all employees working within a regulated area wear the appropriate personal protective equipment (PPE), are trained in the use of appropriate methods of exposure control, and use the hygiene facilities and decontamination procedures specified; and ensuring that engineering controls in use are in proper operating conditions and are functioning properly. The Designated Competent Person shall be responsible for compliance with applicable federal, state and local requirements, the Contractor's Accident Prevention Plan and Asbestos Hazard Abatement Plan. The Designated Competent Person shall provide, and the Contractor shall submit, the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training with the employee "Certificate of Worker Acknowledgment" required by this paragraph. The Contractor shall submit evidence that this person has a minimum of 2 years of on-the-job asbestos abatement experience relevant to OSHA competent person requirements. The Designated Competent Person shall be onsite at all times during the conduct of this project.

- b. Project and Other Supervisors: The Contractor shall provide the name, address, telephone number, and resume of the Project Supervisor and other supervisors who have responsibility to implement the Accident Prevention Plan, including the Asbestos Hazard Abatement Plan and Activity Hazard Analyses, the authority to direct work performed under this contract and verify compliance, and have EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C. The Project Supervisor and other supervisors shall provide, and the Contractor shall submit, the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training with the employee "Certificate of Worker Acknowledgment" required by this paragraph. The Contractor shall submit evidence that the Project Supervisor has a minimum of 2 years of on-the-job asbestos abatement experience relevant to project supervisor responsibilities and the other supervisors have a minimum of 2 years of on-the-job asbestos abatement experience commensurate with the responsibilities they will have on this project.
- c. Designated Industrial Hygienist: The Contractor shall provide the name, address, telephone number, resume and other information specified below for the Industrial Hygienist (IH) selected to prepare the Contractor's Asbestos Hazard Abatement Plan, prepare and perform training, direct air monitoring and assist the Contractor's Competent Person in implementing and ensuring that safety and health requirements are complied with during the performance of all required work. The Designated IH shall be a person who is board certified in the practice of industrial hygiene as determined and documented by the American Board of Industrial Hygiene (ABIH), has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C, and has a minimum of 2 years of comprehensive experience in planning and overseeing asbestos abatement activities. The Designated IH shall provide, and the Contractor shall submit, the "Contractor/Supervisor" course completion certificate and the most recent certificate for

required refresher training with the employee "Certificate of Worker Acknowledgment" required by this paragraph. The **Designated IH shall be completely independent from the Contractor** according to federal, state, or local regulations; that is, shall not be a Contractor's employee or be an employee or principal of a firm in a business relationship with the Contractor negating such independent status. A copy of the Designated IH's current valid ABIH certification shall be included. The Designated IH shall be available when needed for the duration of asbestos activities and shall be available for emergencies. In addition, the Designated IH shall prepare, and the Contractor shall submit, the name, address, telephone numbers and resumes of additional IH's and industrial hygiene technicians (IHT) who will be assisting the Designated IH in performing daily on-site tasks. IHs and IHTs supporting the Designated IH shall have a minimum of 2 years of practical onsite asbestos abatement experience. The formal reporting relationship between the Designated IH and the support IHs and IHTs, the Designated Competent Person, and the Contractor shall be indicated.

- d. Asbestos Abatement Workers: Asbestos abatement workers shall meet the requirements contained in 29 CFR 1926, Section .1101, 40 CFR 61, Subpart M, and other applicable federal, state and local requirements. Worker training documentation shall be provided as required on the "Certificate of Workers Acknowledgment" in this paragraph.
- e. Worker Training and Certification of Worker Acknowledgment: Training documentation will be required for each employee who will perform OSHA Class I, Class II, Class III, or Class IV asbestos abatement operations. Such documentation shall be submitted on a Contractor generated form titled "Certificate of Workers Acknowledgment", to be completed for each employee in the same format and containing the same information as the example certificate at the end of this section. Training course completion certificates (initial and most recent update refresher) required by the information checked on the form shall be attached.
- f. Physician: The Contractor shall provide the name, medical qualifications, address, telephone number and resume of the physician who will or has performed the medical examinations and evaluations of the persons who will conduct the asbestos abatement work tasks. The physician shall be currently licensed by the state where the workers will be or have been examined, have expertise in pneumoconiosis and shall be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1926, Section .1101 and paragraph MEDICAL REQUIREMENTS. The physician shall be familiar with the site's hazards and the scope of this project.
- g. First Aid and CPR Trained Persons: The names of at least 2 persons who are currently trained in first aid and CPR by the American Red Cross or other approved agency shall be designated and shall be onsite at all times during site operations. They shall be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030 and shall be included in the Contractor's Bloodborne Pathogen Program. These persons may perform other duties but

shall be immediately available to render first aid when needed. A copy of each designated person's current valid First Aid and CPR certificate shall be provided.

- h. Independent Testing Laboratory: The Contractor shall provide the name, address and telephone number of the independent testing laboratory selected to perform the sample analyses and report the results. The testing laboratory shall be completely independent from the Contractor as recognized by federal, state or local regulations. Written verification of the following criteria, signed by the testing laboratory principal and the Contractor, shall be submitted:

(1) Phase contrast microscopy (PCM): The laboratory is fully equipped and proficient in conducting PCM of airborne samples using the methods specified by 29 CFR 1926, Section .1101, OSHA method ID-160, the most current version of NIOSH 84-100 Method 7400, and NIOSH 84-100 Method 7402, transmission electron microscopy (TEM); the laboratory is currently judged proficient (classified as acceptable) in counting airborne asbestos samples by PCM by successful participation in each of the last 4 rounds in the American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program; the names of the selected microscopists who will analyze airborne samples by PCM with verified documentation of their proficiency to conduct PCM analyses by being judged proficient in counting samples as current participating analysts in the AIHA PAT Program, and having successfully completed the Asbestos Sampling and Analysis course (NIOSH 582 or equivalent) with a copy of course completion certificate provided; when the PCM analysis is to be conducted onsite, documentation shall be provided certifying that the onsite analyst meets the same requirements.

(2) Polarized light microscopy (PLM): The laboratory is fully equipped and proficient in conducting PLM analyses of suspect ACM bulk samples in accordance with 40 CFR 763, Subpart E, Appendix E; the laboratory is currently accredited by NIST under the NVLAP for bulk asbestos analysis and will use analysts (names shall be provided) with demonstrated proficiency to conduct PLM to include its application to the identification and quantification of asbestos content.

(3) Transmission electron microscopy (TEM): The laboratory is [fully equipped and proficient in conducting TEM analysis of airborne samples using the mandatory method specified by 40 CFR 763, Subpart E, Appendix E; the laboratory is currently accredited by NIST under the NVLAP for airborne sample analysis of asbestos by TEM; the laboratory will use analysts (names shall be provided) that are currently evaluated as competent with demonstrated proficiency under the NIST NVLAP for airborne sample analysis of asbestos by TEM. The analytical laboratory shall be proficient in conducting analysis for low asbestos concentration, enhanced analysis of floor tiles and bulk materials where multiple layers are present, using an improved EPA test method titled, "Method for the Determination of Asbestos in Bulk Building Materials".

(4) PCM/TEM: The laboratory is fully equipped and each analyst (name shall be provided) possesses demonstrated proficiency in conducting PCM and TEM analysis of airborne samples using NIOSH

84-100 Method 7400 PCM and NIOSH 84-100 Method 7402 (TEM confirmation of asbestos content of PCM results) from the same filter.

- i. Disposal Facility, Transporter: The Contractor shall have Fort Hood Sanitary Landfill approval for asbestos disposal. Copies of signed agreements between the Contractor (including subcontractors and transporters) and the asbestos waste disposal facility to accept and dispose of all asbestos containing waste generated during the performance of this contract shall be provided as closure document to the COR. Qualifications shall be provided for each subcontractor or transporter to be used, indicating previous experience in transport and disposal of asbestos waste to include all required state and local waste hauler requirements for asbestos. The Contractor and transporters shall meet the DOT requirements of 49 CFR 171, 49 CFR 172, and 49 CFR 173 as well as registration requirements of 49 CFR 107 and other applicable state or local requirements. The disposal facility shall meet the requirements of 40 CFR 61, Sections .154 or .155, as required in 40 CFR 61, Section .150(b), and other applicable state or local requirements.

1.5.3 Federal, State or Local Citations on Previous Projects

The Contractor and all subcontractors shall submit a statement, signed by an officer of the company, containing a record of any citations issued by Federal, State or local regulatory agencies relating to asbestos activities (including projects, dates, and resolutions); a list of penalties incurred through non-compliance with asbestos project specifications, including liquidated damages, overruns in scheduled time limitations and resolutions; and situations in which an asbestos-related contract has been terminated (including projects, dates, and reasons for terminations). If there are none, a negative declaration signed by an officer of the company shall be provided.

1.6 REGULATORY REQUIREMENTS

In addition to detailed requirements of this specification, work performed under this contract shall comply with EM 385-1-1, applicable federal, state, and local laws, ordinances, criteria, rules and regulations regarding handling, storing, transporting, and disposing of asbestos waste materials. This includes, but is not limited to, OSHA standards, 29 CFR 1926, especially Section .1101, 40 CFR 61, Subpart M and 40 CFR 763. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply. The following state and local laws, rules and regulations regarding demolition, removal, encapsulation, construction alteration, repair, maintenance, renovation, spill/emergency cleanup, housekeeping, handling, storing, transporting and disposing of asbestos material apply: Texas Asbestos Health Protection Rules (TAHPA), Section 295.31 through 295.73.

1.7 SAFETY AND HEALTH PROGRAM AND PLANS

The Contractor shall develop and submit a written comprehensive site-specific Accident Prevention Plan during initial design submittal. The Accident Prevention Plan shall address requirements of EM 385-1-1,

Appendix A, covering onsite work to be performed by the Contractor and subcontractors. The Accident Prevention Plan shall incorporate an Asbestos Hazard Abatement Plan, and Activity Hazard Analyses as separate appendices into 1 site specific Accident Prevention Plan document. Any portions of the Contractor's overall Safety and Health Program that are referenced in the Accident Prevention Plan, e.g., respirator program, hazard communication program, confined space entry program, etc., shall be included as appendices to the Accident Prevention Plan. The plan shall take into consideration all the individual asbestos abatement work tasks identified in Table 1. The plan shall be prepared, signed (and sealed, including certification number if required), and dated by the Contractor's Designated IH, Competent Person, and Project Supervisor.

1.7.1 Asbestos Hazard Abatement Plan Appendix

The Asbestos Hazard Abatement Plan appendix to the Accident Prevention Plan shall include, but not be limited to, the following:

- a. The personal protective equipment to be used;
- b. The location and description of regulated areas including clean and dirty areas, access tunnels, and decontamination unit (clean room, shower room, equipment room, storage areas such as load-out unit);
- c. Initial exposure assessment in accordance with 29 CFR 1926, Section .1101;
- d. Level of supervision;
- e. Method of notification of other employers at the worksite;
- f. Abatement method to include containment and control procedures;
- g. Interface of trades involved in the construction;
- h. Sequencing of asbestos related work;
- i. Storage and disposal procedures and plan;
- j. Type of wetting agent and asbestos encapsulant to be used;
- k. Location of local exhaust equipment;
- l. Air monitoring methods (personal, environmental and clearance);
- m. Bulk sampling and analytical methods (if required);
- n. A detailed description of the method to be employed in order to control the spread of ACM wastes and airborne fiber concentrations;
- o. Fire and medical emergency response procedures;
- p. The security procedures to be used for all regulated areas.

1.7.2 Activity Hazard Analyses Appendix

Activity Hazard Analyses, for each major phase of work, shall be submitted and updated during the project. The Activity Hazard Analyses format shall

be in accordance with EM 385-1-1 (Figure 1-1). The analysis shall define the activities to be performed for a major phase of work, identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on that phase until the Activity Hazard Analyses has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the onsite Government representatives. The Activity Hazard Analyses shall be continuously reviewed and, when appropriate, modified to address changing site conditions or operations.

1.8 PRECONSTRUCTION CONFERENCE AND ONSITE SAFETY

The Contractor and the Contractor's Designated Competent Person, Project Supervisor, Designated IH, and the third party independent analytical lab for air monitoring and testing, shall meet with the Contracting Officer prior to beginning work at a safety preconstruction conference to discuss the details of the Contractor's submitted Accident Prevention Plan to include the Asbestos Hazard Abatement Plan and Activity Hazard Analyses appendices. Deficiencies in the Accident Prevention Plan will be discussed and the Accident Prevention Plan shall be revised to correct the deficiencies and resubmitted for acceptance. Any changes required in the specification as a result of the Accident Prevention Plan shall be identified specifically in the plan to allow for free discussion and acceptance by the Contracting Officer, prior to the start of work. Onsite work shall not begin until the Accident Prevention Plan has been accepted. A copy of the written Accident Prevention Plan shall be maintained onsite. Changes and modifications to the accepted Accident Prevention Plan shall be made with the knowledge and concurrence of the Designated IH, the Project Supervisor, Designated Competent Person, and the Contracting Officer. Should any unforeseen hazard become evident during the performance of the work, the Designated IH shall bring such hazard to the attention of the Project Supervisor, Designated Competent Person, and the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, all necessary action shall be taken by the Contractor to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Once accepted by the Contracting Officer, the Accident Prevention Plan, including the Asbestos Hazard Abatement Plan and Activity Hazard Analyses will be enforced as if an addition to the contract. Disregarding the provisions of this contract or the accepted Accident Prevention Plan will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

1.9 SECURITY

Fenced or enclosed and locked security area shall be provided for each abatement regulated area. A log book shall be kept documenting entry into and out of the regulated area. Entry into regulated areas shall only be by personnel authorized by the Contractor and the Contracting Officer. Personnel authorized to enter regulated areas shall be trained, be medically evaluated, and wear the required personal protective equipment for the specific regulated area to be entered.

1.10 MEDICAL REQUIREMENTS

Medical requirements shall conform to 29 CFR 1926, Section .1101.

1.10.1 Medical Examinations

Before being exposed to airborne asbestos fibers, workers shall be provided with a medical examination as required by 29 CFR 1926, Section .1101 and other pertinent state or local requirements. This requirement shall have been satisfied within the last 12 months. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. X-ray films of asbestos workers shall be identified to the consulting radiologist and medical record jackets shall be marked with the word "asbestos."

1.10.1.1 Information Provided to the Physician

The Contractor shall provide the following information in writing to the examining physician:

- a. A copy of 29 CFR 1926, Section .1101 and Appendices D, E, G, and I;
- b. A description of the affected employee's duties as they relate to the employee's exposure;
- c. The employee's representative exposure level or anticipated exposure level;
- d. A description of any personal protective and respiratory equipment used or to be used;
- e. Information from previous medical examinations of the affected employee that is not otherwise available to the examining physician.

1.10.1.2 Written Medical Opinion

For each worker, a written medical opinion prepared and signed by a licensed physician indicating the following:

- a. Summary of the results of the examination.
- b. The potential for an existing physiological condition that would place the employee at an increased risk of health impairment from exposure to asbestos.
- c. The ability of the individual to wear personal protective equipment, including respirators, while performing strenuous work tasks under cold and/or heat stress conditions.
- d. A statement that the employee has been informed of the results of the examination, provided with a copy of the results, informed of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure, and informed of any medical condition that may result from asbestos exposure.

1.10.2 Medical and Exposure Records

Complete and accurate records shall be maintained of each employee's medical examinations, medical records, and exposure data, as required by 29 CFR 1910, Section .1910.20 and 29 CFR 1926, Section .1101 for a period of 30 years after termination of employment. Records of the required medical

examinations and exposure data shall be made available, for inspection and copying, to the Assistant Secretary of Labor for Occupational Safety and Health (OSHA) or authorized representatives of the employee and an employee's physician upon request of the employee or former employee. A copy of the required medical certification for each employee shall be maintained on file at the worksite for review, as requested by the Contracting Officer or the representatives.

1.11 TRAINING PROGRAM

1.11.1 General Training Requirements

The Contractor shall establish a training program as specified by EPA Model Accreditation Plan (MAP), training requirements at 40 CFR 763, Subpart E, Appendix C, the State of Texas Texas, Asbestos Health Protection Rules, Section 295.31 through 295.73 , OSHA requirements at 29 CFR 1926, Section .1101(k)(9), and this specification. Contractor employees shall complete the required training for the type of work they are to perform and such training shall be documented and provided to the Contracting Officer as specified in paragraph QUALIFICATIONS.

1.11.2 Project Specific Training

Prior to commencement of work, each worker shall be instructed by the Contractor's Designated IH and Competent Person in the following project specific training:

- a. The hazards and health effects of the specific types of ACM to be abated;
- b. The content and requirements of the Contractor's Accident Prevention Plan to include the Asbestos Hazard Abatement Plan and Activity Hazard Analyses and site-specific safety and health precautions;
- c. Hazard Communication Program;
- d. Hands-on training for each asbestos abatement technique to be employed;
- e. Heat and/or cold stress monitoring specific to this project;
- f. Air monitoring program and procedures;
- g. Medical surveillance to include medical and exposure record-keeping procedures;
- h. The association of cigarette smoke and asbestos-related disease;
- i. Security procedures;
- j. Specific work practice controls and engineering controls required for each Class of work in accordance with 29 CFR 1926, Section .1101.

1.12 RESPIRATORY PROTECTION PROGRAM

The Contractor's Designated IH shall establish in writing, and implement a respiratory protection program in accordance with 29 CFR 1926, Section .1101, 29 CFR 1910, Section .134, ANSI Z88.2, CGA G-7, CGA G-7.1 and DETAIL SHEET

12. The Contractor's Designated IH shall establish minimum respiratory protection requirements based on measured or anticipated levels of airborne asbestos fiber concentrations encountered during the performance of the asbestos abatement work. The Contractor's respiratory protection program shall include, but not be limited to, the following elements:

- a. The company policy, used for the assignment of individual responsibility, accountability, and implementation of the respiratory protection program.
- b. The standard operating procedures covering the selection and use of respirators. Respiratory selection shall be determined by the hazard to which the worker is exposed.
- c. Medical evaluation of each user to verify that the worker may be assigned to an activity where respiratory protection is required.
- d. Training in the proper use and limitations of respirators.
- e. Respirator fit-testing, i.e., quantitative, qualitative and individual functional fit checks.
- f. Regular cleaning and disinfection of respirators.
- g. Routine inspection of respirators during cleaning and after each use when designated for emergency use.
- h. Storage of respirators in convenient, clean, and sanitary locations.
- i. Surveillance of regulated area conditions and degree of employee exposure (e.g., through air monitoring).
- j. Regular evaluation of the continued effectiveness of the respiratory protection program.
- k. Recognition and procedures for the resolution of special problems as they affect respirator use (e.g., no facial hair that comes between the respirator face piece and face or interferes with valve function; prescription eye wear usage; contact lenses usage; etc.).
- l. Proper training in putting on and removing respirators.

1.12.1 Respiratory Fit Testing

A qualitative or quantitative fit test conforming to 29 CFR 1926, Section 1101, Appendix C shall be conducted by the Contractor's Designated IH for each Contractor worker required to wear a respirator, and for the Contracting Officer and authorized visitors who enter a regulated area where respirators are required to be worn. A respirator fit test shall be performed for each worker wearing a negative-pressure respirator prior to initially wearing a respirator on this project and every 6 months thereafter. The qualitative fit tests may be used only for testing the fit of half-mask respirators where they are permitted to be worn, or of full-facepiece air purifying respirators where they are worn at levels at which half-facepiece air purifying respirators are permitted. If physical changes develop that will affect the fit, a new fit test for the worker shall be performed. Functional fit checks shall be performed by employees

each time a respirator is put on and in accordance with the manufacturer's recommendation.

1.12.2 Respirator Selection and Use Requirements

The Contractor shall provide respirators, and ensure that they are used as required by 29 CFR 1926, Section .1101 and in accordance with the manufacturer's recommendations. Respirators shall be jointly approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (MSHA/NIOSH), or by NIOSH, under the provisions of 42 CFR 84, for use in environments containing airborne asbestos fibers. Personnel who handle ACM, enter regulated areas that require the wearing of a respirator, or who are otherwise carrying out abatement activities that require the wearing of a respirator, shall be provided with approved respirators that are fully protective of the worker at the measured or anticipated airborne asbestos concentration level to be encountered. For air-purifying respirators, the particulate filter portion of the cartridges or canister approved for use in airborne asbestos environments shall be high-efficiency particulate air (HEPA). The initial respirator selection and the decisions regarding the upgrading or downgrading of respirator type shall be made by the Contractor's Designated IH based on the measured or anticipated airborne asbestos fiber concentrations to be encountered. Recommendations made by the Contractor's Designated IH to downgrade respirator type shall be submitted in writing to the Contracting Officer. The Contractor's Designated Competent Person in consultation with the Designated IH, shall have the authority to take immediate action to upgrade or downgrade respiratory type when there is an immediate danger to the health and safety of the wearer. Respirators shall be used in the following circumstances:

- a. During all Class I asbestos jobs.
- b. During all Class II work where the ACM is not removed in a substantially intact state.
- c. During all Class II and III work which is not performed using wet methods. Respirators need not be worn during removal of ACM from sloped roofs when a negative exposure assessment has been made and ACM is removed in an intact state.
- d. During all Class II and III asbestos jobs where the Contractor does not produce a negative exposure assessment.
- e. During all Class III jobs where TSI or surfacing ACM is being disturbed.
- f. During all Class IV work performed within regulated areas where employees performing other work are required to wear respirators.
- g. During all work where employees are exposed above the PEL-TWA or PEL-Excursion Limit.
- h. In emergencies

1.12.3 Class I Work

The Contractor shall provide: (1) a tight-fitting, powered air purifying respirator equipped with high efficiency filters, or (2) a full-facepiece supplied air respirator operated in the pressure demand mode, equipped with

HEPA egress cartridges, or (3) an auxiliary positive pressure self-contained breathing apparatus, for all employees within the regulated area where Class I work is being performed; provided that a negative exposure assessment has not been produced, and that the exposure level will not exceed 1 f/cc as an 8-hour time weighted average. A full-facepiece supplied air respirator, operated in the pressure demand mode, equipped with an auxiliary positive pressure self-contained breathing apparatus shall be provided under such conditions, if the exposure assessment indicates exposure levels above 1 f/cc as an 8-hour time weighted average.

1.12.4 Class II Work

The Contractor shall provide an air purifying respirator, other than a disposable respirator, equipped with high-efficiency filters whenever the employee performs Class II asbestos jobs where the Contractor does not produce a negative exposure assessment ; and Class I jobs where TSI or surfacing ACM is being disturbed.

1.12.5 Sanitation

Employees who wear respirators shall be permitted to leave work areas to wash their faces and respirator facepieces whenever necessary to prevent skin irritation associated with respirator use.

1.13 HAZARD COMMUNICATION PROGRAM

A hazard communication program shall be established and implemented in accordance with 29 CFR 1926, Section .59. Material safety data sheets (MSDSs) shall be provided for all hazardous materials brought onto the worksite. One copy shall be provided to the Contracting Officer and 1 copy shall be included in the Contractor's Hazard Communication Program.

1.14 LICENSES, PERMITS AND NOTIFICATIONS

1.14.1 General Legal Requirements

Necessary licenses, permits and notifications shall be obtained in conjunction with the project's asbestos abatement, transportation and disposal actions and timely notification furnished of such actions as required by federal, state, regional, and local authorities. The Contractor shall notify Texas Department of Health in writing, at least 10 days prior to the commencement of work, in accordance with 40 CFR 61, Subpart M, and state and local requirements to include the mandatory "Notification of Demolition and Renovation Record" form and other required notification documents. The contractor shall schedule notification so as not to delay the building renovation and the project schedule.

Notification shall be by Certified Mail, Return Receipt Requested. The Contractor shall furnish copies of the receipts to the Contracting Officer, in writing, prior to the commencement of work. Local fire department shall be notified 3 days before fire-proofing material is removed from a building and the notice shall specify whether or not the material contains asbestos.

A copy of the rental company's written acknowledgment and agreement shall be provided as required by paragraph RENTAL EQUIPMENT. For licenses, permits, and notifications that the Contractor is responsible for obtaining, the Contractor shall pay any associated fees or other costs incurred.

1.14.2 Litigation and Notification

The Contractor shall notify the Contracting Officer if any of the following occur:

- a. The Contractor or any of the subcontractors are served with notice of violation of any law, regulation, permit or license which relates to this contract;
- b. Proceedings are commenced which could lead to revocation of related permits or licenses; permits, licenses or other Government authorizations relating to this contract are revoked;
- c. Litigation is commenced which would affect this contract;
- d. The Contractor or any of the subcontractors become aware that their equipment or facilities are not in compliance or may fail to comply in the future with applicable laws or regulations.

1.15 PERSONAL PROTECTIVE EQUIPMENT

Three complete sets of personal protective equipment shall be made available to the Contracting Officer and authorized visitors for entry to the regulated area. Contracting Officer and authorized visitors shall be provided with training equivalent to that provided to Contractor employees in the selection, fitting, and use of the required personal protective equipment and the site safety and health requirements. Contractor workers shall be provided with personal protective clothing and equipment and the Contractor shall ensure that it is worn properly. The Contractor's Designated IH and Designated Competent Person shall select and approve all the required personal protective clothing and equipment to be used.

1.15.1 Respirators

Respirators shall be in accordance with paragraph RESPIRATORY PROTECTION PROGRAM.

1.15.2 Whole Body Protection

Personnel exposed to airborne concentrations of asbestos that exceed the PELs, or for all OSHA Classes of work for which a required negative exposure assessment is not produced, shall be provided with whole body protection and such protection shall be worn properly. The Contractor's Designated IH and Competent Person shall select and approve the whole body protection to be used. The Competent Person shall examine work suits worn by employees at least once per work shift for rips or tears that may occur during performance of work. When rips or tears are detected while an employee is working, rips and tears shall be immediately mended, or the work suit shall be immediately replaced. Disposable whole body protection shall be disposed of as asbestos contaminated waste upon exiting from the regulated area. Reusable whole body protection worn shall be either disposed of as asbestos contaminated waste upon exiting from the regulated area or be properly laundered in accordance with 29 CFR 1926, Section .1101.

Whole body protection used for asbestos abatement shall not be removed from the worksite by a worker to be cleaned. Recommendations made by the Contractor's Designated IH to downgrade whole body protection shall be submitted in writing to the Contracting Officer. The Contractor's Designated Competent Person, in consultation with the Designated IH, has the authority to take immediate action to upgrade or downgrade whole body

protection when there is an immediate danger to the health and safety of the wearer.

1.15.2.1 Coveralls

Disposable-breathable coveralls with a zipper front shall be provided. Sleeves shall be secured at the wrists, and foot coverings secured at the ankles. See DETAIL SHEET 13.

1.15.2.2 Underwear

Disposable underwear shall be provided. If reusable underwear are used, they shall be disposed of as asbestos contaminated waste or laundered in accordance with 29 CFR 1926, Section .1101. Asbestos abatement workers shall not remove contaminated reusable underwear worn during abatement of ACM from the site to be laundered.

1.15.2.3 Work Clothing

An additional coverall shall be provided when the abatement and control method employed does not provide for the exit from the regulated area directly into an attached decontamination unit. Cloth work clothes for wear under the protective coverall, and foot coverings, shall be provided when work is being conducted in low temperature conditions. Cloth work clothes shall be either disposed of as asbestos contaminated waste or properly laundered in accordance with 29 CFR 1926, Section .1101.

1.15.2.4 Gloves

Gloves shall be provided to protect the hands. Where there is the potential for hand injuries (i.e., scrapes, punctures, cuts, etc.) a suitable glove shall be provided and used.

1.15.2.5 Foot Coverings

Cloth socks shall be provided and worn next to the skin. Footwear, as required by OSHA and EM 385-1-1, that is appropriate for safety and health hazards in the area shall be worn. Rubber boots shall be used in moist or wet areas. Reusable footwear removed from the regulated area shall be thoroughly decontaminated or disposed of as ACM waste. Disposable protective foot covering shall be disposed of as ACM waste. If rubber boots are not used, disposable foot covering shall be provided.

1.15.2.6 Head Covering

Hood type disposable head covering shall be provided. In addition, protective head gear (hard hats) shall be provided as required. Hard hats shall only be removed from the regulated area after being thoroughly decontaminated.

1.15.2.7 Protective Eye Wear

Eye protection provided shall be in accordance with ANSI Z87.1.

1.16 HYGIENE FACILITIES AND PRACTICES

The Contractor shall establish a decontamination area for the decontamination of employees, material and equipment. The Contractor shall ensure that employees enter and exit the regulated area through the

decontamination area.

1.16.1 Shower Facilities

Shower facilities, when provided, shall comply with 29 CFR 1910, Section .141(d)(3).

1.16.2 3-Stage Decontamination Area

A temporary negative pressure decontamination unit that is adjacent and attached in a leak-tight manner to the regulated area shall be provided as described in SET-UP DETAIL SHEET Numbers 22 and 23. Utilization of prefabricated units shall have prior approval of the Contracting Officer. The decontamination unit shall have an equipment room and a clean room separated by a shower that complies with 29 CFR 1910, Section .141 (unless the Contractor can demonstrate that such facilities are not feasible). Equipment and surfaces of containers filled with ACM shall be cleaned prior to removing them from the equipment room or area. Surfaces of the equipment room shall be wet wiped 2 times after each shift. Materials used for wet wiping shall be disposed of as asbestos contaminated waste. Two separate lockers shall be provided for each asbestos worker, one in the equipment room and one in the clean room. Hot water service may be secured from the building hot water system provided backflow protection is installed by the Contractor at the point of connection. Should sufficient hot water be unavailable, the Contractor shall provide a minimum 40 gal. electric water heater with minimum recovery rate of 20 gal. per hour and a temperature controller for each showerhead. The Contractor shall provide a minimum of showers as needed to meet the project completion schedule. Instantaneous type in-line water heater may be incorporated at each shower head in lieu of hot water heater, upon approval by the Contracting Officer.

Flow and temperature controls shall be located within the shower and shall be adjustable by the user. The wastewater pump shall be sized for 1.25 times the showerhead flow-rate at a pressure head sufficient to satisfy the filter head loss and discharge line losses. The pump shall supply a minimum 25 gpm flow with 35 ft. of pressure head. Used shower water shall be collected and filtered to remove asbestos contamination. Filters and residue shall be disposed of as asbestos contaminated material, per DETAIL SHEETS 9 and 14. Filtered water shall be discharged to the sanitary system.

Wastewater filters shall be installed in series with the first stage pore size of 20 microns and the second stage pore size of 5 microns. The floor of the decontamination unit's clean room shall be kept dry and clean at all times. Water from the shower shall not be allowed to wet the floor in the clean room. Surfaces of the clean room and shower shall be wet-wiped 2 times after each shift change with a disinfectant solution. Proper housekeeping and hygiene requirements shall be maintained. Soap and towels shall be provided for showering, washing and drying. Any cloth towels provided shall be disposed of as ACM waste or shall be laundered in accordance with 29 CFR 1926, Section .1101.

1.16.3 Load-Out Unit

A temporary load-out unit that is adjacent and connected to the regulated area and access tunnel shall be provided as described in DETAIL SHEET Number 20 and 25. Utilization of prefabricated units shall have prior approval of the Contracting Officer. The load-out unit shall be attached in a leak-tight manner to each regulated area. Surfaces of the load-out unit and access tunnel shall be adequately wet-wiped 2 times after each shift change. Materials used for wet wiping shall be disposed of as asbestos contaminated waste.

1.16.4 Single Stage Decontamination Area

A decontamination area (equipment room/area) shall be provided for Class I work involving less than 25 feet or 10 square feet of TSI or surfacing ACM, and for Class II asbestos work operations where exposures exceed the PELs or where there is no negative exposure assessment produced before the operation. The equipment room or area shall be adjacent to the regulated area for the decontamination of employees, material, and their equipment which is contaminated with asbestos. The equipment room or area shall consist of an area covered by an impermeable drop cloth on the floor or horizontal working surface. The area must be of sufficient size to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area. Surfaces of the equipment room shall be wet wiped 2 times after each shift. Materials used for wet wiping shall be disposed of as asbestos contaminated waste.

1.16.5 Decontamination Requirements for Class IV Work

The Contractor shall ensure that employees performing Class IV work within a regulated area comply with the hygiene practice required of employees performing work which has a higher classification within that regulated area, or the Contractor shall provide alternate decontamination area facilities for employees cleaning up debris and material which is TSI or surfacing ACM.

1.16.6 Decontamination Area Entry Procedures

The Contractor shall ensure that employees entering the decontamination area through the clean room or clean area:

- a. Remove street clothing in the clean room or clean area and deposit it in lockers.
- b. Put on protective clothing and respiratory protection before leaving the clean room or clean area.
- c. Pass through the equipment room to enter the regulated area.

1.16.7 Decontamination Area Exit Procedures

The Contractor shall ensure that the following procedures are followed:

- a. Before leaving the regulated area, respirators shall be worn while employees remove all gross contamination and debris from their work clothing using a HEPA vacuum.
- b. Employees shall remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers (see Detail Sheets 9 and 14) for disposal and/or laundering.
- c. Employees shall not remove their respirators in the equipment room.
- d. Employees shall shower prior to entering the clean room. If a shower has not been located between the equipment room and the clean room or the work is performed outdoors, the Contractor shall ensure that employees engaged in Class I asbestos jobs: a) Remove asbestos contamination from their work suits in the equipment room or decontamination area using a HEPA vacuum before proceeding to a

shower that is not adjacent to the work area; or b) Remove their contaminated work suits in the equipment room, without cleaning worksuits, and proceed to a shower that is not adjacent to the work area.

- e. After showering, employees shall enter the clean room before changing into street clothes.

1.16.8 Lunch Areas

The Contractor shall provide lunch areas in which the airborne concentrations of asbestos are below 0.01 f/cc.

1.16.9 Smoking

Smoking, if allowed by the Contractor, shall only be permitted in designated areas approved by the Contracting Officer.

1.17 REGULATED AREAS

All Class I and II asbestos work shall be conducted within regulated areas.

The regulated area shall be demarcated to minimize the number of persons within the area and to protect persons outside the area from exposure to airborne asbestos. Where critical barriers or negative pressure enclosures are used, they shall demarcate the regulated area. Access to regulated areas shall be limited to authorized persons. The Contractor shall control access to regulated areas, ensure that only authorized personnel enter, and verify that Contractor required medical surveillance, training and respiratory protection program requirements are met prior to allowing entrance.

1.18 WARNING SIGNS AND TAPE

Warning signs and tape printed bilingually in English and Spanish, and in pictographs and graphics shall be provided at the regulated boundaries and entrances to regulated areas. The Contractor shall ensure that all personnel working in areas contiguous to regulated areas comprehend the warning signs. Signs shall be located to allow personnel to read the signs and take the necessary protective steps required before entering the area. Warning signs, as shown and described in DETAIL SHEET 11, shall be in vertical format conforming to 29 CFR 1910 and 29 CFR 1926, Section .1101, a minimum of 20 by 14 inches, and displaying the following legend in the lower panel:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

Spacing between lines shall be at least equal to the height of the upper of any two lines. Warning tape shall be provided as shown and described on DETAIL SHEET 11. Decontamination unit signage shall be as shown and described on DETAIL SHEET 15.

1.19 WARNING LABELS

Warning labels shall be affixed to all asbestos disposal containers used to contain asbestos materials, scrap, waste debris, and other products

contaminated with asbestos. Containers with preprinted warning labels conforming to requirements are acceptable. Warning labels shall be as described in DETAIL SHEET 14, shall conform to 29 CFR 1926, Section .1101 and shall be of sufficient size to be clearly legible displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

1.20 LOCAL EXHAUST VENTILATION

Local exhaust ventilation units shall conform to ANSI Z9.2 and 29 CFR 1926, Section .1101. Filters on local exhaust system equipment shall conform to ANSI Z9.2 and UL 586. Filter shall be UL labeled.

1.21 TOOLS

Vacuums shall be leak proof to the filter, equipped with HEPA filters, of sufficient capacity and necessary capture velocity at the nozzle or nozzle attachment to efficiently collect, transport and retain the ACM waste material. Power tools shall not be used to remove ACM unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation capture and collection system, or has otherwise been approved for use by the Contracting Officer. Residual asbestos shall be removed from reusable tools prior to storage and reuse. Reusable tools shall be thoroughly decontaminated prior to being removed from regulated areas.

1.22 RENTAL EQUIPMENT

If rental equipment is to be used, written notification shall be provided to the rental agency, concerning the intended use of the equipment, the possibility of asbestos contamination of the equipment and the steps that will be taken to decontaminate such equipment. A written acceptance of the terms of the Contractor's notification shall be obtained from the rental agency.

1.23 AIR MONITORING EQUIPMENT

The Contractor's Designated IH shall approve air monitoring equipment to be used to collect samples. The equipment shall include, but shall not be limited to:

- a. High-volume sampling pumps that can be calibrated and operated at a constant airflow up to 16 liters per minute when equipped with a sampling train of tubing and filter cassette.
- b. Low-volume, battery powered, body-attachable, portable personal pumps that can be calibrated to a constant airflow up to approximately 3.5 liters per minute when equipped with a sampling train of tubing and filter cassette, and a self-contained rechargeable power pack capable of sustaining the calibrated flow rate for a minimum of 10 hours. The pumps shall also be equipped with an automatic flow control unit which shall maintain a constant flow, even as filter resistance increases due to accumulation of fiber and debris on the filter surface.
- c. Single use standard 25 mm diameter cassette, open face, 0.8 micron

pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive extension cowl, and shrink bands, to be used with low flow pumps in accordance with 29 CFR 1926, Section .1101 for personal air sampling.

- d. Single use standard 25 mm diameter cassette, open face, 0.45 micron pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive cowl, and shrink bands, to be used with high flow pumps when conducting environmental area sampling using NIOSH 84-100 Methods 7400 and 7402, (and the transmission electric microscopy method specified at 40 CFR 763 if required).
- e. Appropriate plastic tubing to connect the air sampling pump to the selected filter cassette.
- f. A flow calibrator capable of calibration to within plus or minus 2 percent of reading over a temperature range of minus 4 to plus 140 degrees F and traceable to a NIST primary standard.

1.24 EXPENDABLE SUPPLIES

1.24.1 Glovebag

Glovebags shall be provided as described in 29 CFR 1926, Section .1101 and SET-UP DETAIL SHEET 10. The glovebag assembly shall be 6 mil thick plastic, prefabricated and seamless at the bottom with preprinted OSHA warning label.

1.24.2 Duct Tape

Industrial grade duct tape of appropriate widths suitable for bonding sheet plastic and disposal container shall be provided.

1.24.3 Disposal Containers

Leak-tight (defined as solids, liquids, or dust that cannot escape or spill out) disposal containers shall be provided for ACM wastes as required by 29 CFR 1926 Section .1101 and DETAIL SHEETS 9A, 9B, 9C and 14.

1.24.4 Disposal Bags

Leak-tight bags, 6 mil thick, shall be provided for placement of asbestos generated waste as described in DETAIL SHEET 9A.

1.24.5 Not Use

1.24.6 Cardboard Boxes

Heavy-duty corrugated cardboard boxes, coated with plastic or wax to retard deterioration from moisture, shall be provided as described in DETAIL SHEET 9C, if required by state and local requirements. Boxes shall fit into selected ACM disposal bags. Filled boxes shall be sealed leak-tight with duct tape.

1.24.7 Sheet Plastic

Sheet plastic shall be polyethylene of 6 mil minimum thickness and shall be provided in the largest sheet size necessary to minimize seams ,as

indicated on the project drawings. Film shall be frosted and conform to ASTM D 4397, except as specified below:

1.24.7.1 Flame Resistant

Where a potential for fire exists, flame-resistant sheets shall be provided. Film shall be frosted and shall conform to the requirements of NFPA 701.

1.24.7.2 Reinforced

Reinforced sheets shall be provided where high skin strength is required, such as where it constitutes the only barrier between the regulated area and the outdoor environment. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between 2 layers of polyethylene film. Film shall meet flame resistant standards of NFPA 701.

1.24.8 Amended Water

Amended water shall meet the requirements of ASTM D 1331.

1.24.9 Mastic Removing Solvent

Mastic removing solvent shall be nonflammable and shall not contain methylene chloride, glycol ether, or halogenated hydrocarbons. Solvents used onsite shall have a flash point greater than 140 degrees F.

1.24.10 Leak-tight Wrapping

Two layers of 6 mil minimum thick polyethylene sheet stock shall be used for the containment of removed asbestos-containing components or materials such as reactor vessels, large tanks, boilers, insulated pipe segments and other materials too large to be placed in disposal bags as described in DETAIL SHEET 9B. Upon placement of the ACM component or material, each layer shall be individually leak-tight sealed with duct tape.

1.24.11 Viewing Inspection Window

Where feasible, a minimum of 1 clear, 1/8 inch thick, acrylic sheet, 18 by 24 inches, shall be installed as a viewing inspection window at eye level on a wall in each containment enclosure. The windows shall be sealed leak-tight with industrial grade duct tape.

1.24.12 Wetting Agents

Removal encapsulant (a penetrating encapsulant) shall be provided when conducting removal abatement activities that require a longer removal time or are subject to rapid evaporation of amended water. The removal encapsulant shall be capable of wetting the ACM and retarding fiber release during disturbance of the ACM greater than or equal to that provided by amended water. Performance requirements for penetrating encapsulants are specified in paragraph ENCAPSULANTS.

1.24.13 Strippable Coating

Strippable coating in aerosol cans shall be used to adhere to surfaces and to be removed cleanly by stripping, at the completion of work. This work shall only be done in well ventilated areas.

1.25 MISCELLANEOUS ITEMS

A sufficient quantity of other items, such as, but not limited to: scrapers, brushes, brooms, staple guns, tarpaulins, shovels, rubber squeegees, dust pans, other tools, scaffolding, staging, enclosed chutes, wooden ladders, lumber necessary for the construction of containments, UL approved temporary electrical equipment, material and cords, ground fault circuit interrupters, water hoses of sufficient length, fire extinguishers, first aid kits, portable toilets, logbooks, log forms, markers with indelible ink, spray paint in bright color to mark areas, project boundary fencing, etc., shall be provided.

PART 2 PRODUCTS

2.1 ENCAPSULANTS

Encapsulants shall conform to USEPA requirements, shall contain no toxic or hazardous substances and no solvent and shall meet the following requirements:

ALL ENCAPSULANTS

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E 84
Combustion Toxicity Zero Mortality	Univ. of Pittsburgh Protocol
Life Expectancy, 20 yrs Accelerated Aging Test	ASTM C 732
Permeability, Minimum 0.4 perms	ASTM E 96

Additional Requirements for Bridging Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test, 50 pounds of force/foot	ASTM E 736
Fire Resistance, Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E 119
Impact Resistance, Minimum 43 in-lb (Gardner Impact Test)	ASTM D 2794
Flexibility, no rupture or cracking (Mandrel Bend Test)	ASTM D 522

Additional Requirements for Penetrating Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test, 50 pounds of force/foot	ASTM E 736
Fire Resistance, Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and	ASTM E 119

ALL ENCAPSULANTS

Requirement	Test Standard
cementitious sprayed fireproofing)	
Impact Resistance, Minimum	ASTM D 2794
43 in-lb (Gardner Impact Test)	
Flexibility, no rupture or	ASTM D 522
cracking (Mandrel Bend Test)	

Additional Requirements for Lockdown Encapsulant

Requirement	Test Standard
Fire Resistance, Negligible	ASTM E 119
affect on fire resistance	
rating over 3 hour test (Tested	
with fireproofing over encapsulant	
applied directly to steel member)	
Bond Strength, 100 pounds of	ASTM E 736
force/foot (Tests	
compatibility with cementitious	
and fibrous fireproofing)	

2.2 ENCASUREMENT PRODUCTS

Encasement shall consist of primary cellular polymer coat, polymer finish coat, and any other finish coat as approved by the Contracting Officer.

2.3 RECYCLABLE MATERIALS

The Contractor shall comply with EPA requirements in accordance with Section 01670 RECYCLED / RECOVERED MATERIALS.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Asbestos abatement work tasks shall be performed as shown on the detailed plans and drawings, as summarized in paragraph DESCRIPTION OF WORK and including Table 1 and the Contractor's Accident Prevention Plan, Asbestos Hazard Abatement Plan, and the Activity Hazard Analyses. The Contractor shall use the engineering controls and work practices required in 29 CFR 1926, Section .1101(g) in all operations regardless of the levels of exposure. Personnel shall wear and utilize protective clothing and equipment as specified. The Contractor shall not permit eating, smoking, drinking, chewing or applying cosmetics in the regulated area. All hot work (burning, cutting, welding, etc.) shall be conducted under controlled conditions in conformance with 29 CFR 1926, Section .352, Fire Prevention. Personnel of other trades, not engaged in asbestos abatement activities, shall not be exposed at any time to airborne concentrations of asbestos unless all the administrative and personal protective provisions of the Contractor's Accident Prevention Plan are complied with. Power to the regulated area shall be locked-out and tagged in accordance with 29 CFR 1910, and temporary electrical service with ground fault circuit interrupters shall be provided as needed. Temporary electrical service shall be disconnected when necessary for wet removal. The Contractor shall stop abatement work in the regulated area immediately when the airborne total fiber concentration: (1) equals or exceeds 0.01 f/cc, or the pre-abatement

concentration, whichever is greater, outside the regulated area; or (2) equals or exceeds 1.0 f/cc inside the regulated area. The Contractor shall correct the condition to the satisfaction of the Contracting Officer, including visual inspection and air sampling. Work shall resume only upon notification by the Contracting Officer. Corrective actions shall be documented.

3.2 PROTECTION OF ADJACENT WORK OR AREAS TO REMAIN

Asbestos abatement shall be performed without damage to or contamination of adjacent work or area. Where such work or area is damaged or contaminated, as verified by the Contracting Officer using visual inspection or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government, as deemed appropriate by the Contracting Officer. This includes inadvertent spill of dirt, dust or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, work shall stop in all effected areas immediately and the spill shall be cleaned. When satisfactory visual inspection and air sampling analysis results are obtained and have been evaluated by the Contractor's Designated IH and the Contracting Officer, work shall proceed.

3.3 OBJECTS

3.3.1 Removal of Mobile Objects

Mobile objects, furniture and equipment will be removed from the area of work by the Government before asbestos abatement work begins.

3.3.2 Stationary Objects

Stationary objects, furniture, and equipment as shown on DETAIL SHEET 27, shall remain in place and shall be precleaned using HEPA vacuum followed by adequate wet wiping. Stationary objects and furnishings shall be covered with 2 layers of polyethylene and edges sealed with duct tape.

3.3.3 Not Use

3.4 BUILDING VENTILATION SYSTEM AND CRITICAL BARRIERS

Building ventilating systems supplying air into or returning air out of a regulated area shall be shut down and isolated by lockable switch or other positive means in accordance with 29 CFR 1910, Section .147. and isolated by airtight seals to prevent the spread of contamination throughout the system. Air-tight critical barriers shall be installed on building ventilating openings located inside the regulated area that supply or return air from the building ventilation system or serve to exhaust air from the building. The critical barriers shall consist of [air-tight rigid covers for building ventilation supply and exhaust grills where the ventilation system is required to remain in service during abatement] [2 layers of polyethylene]. Edges to wall, ceiling and floor surfaces shall be sealed with industrial grade duct tape. Critical barriers shall be installed as shown on drawings and appended SET-UP DETAIL SHEETS.

3.5 PRECLEANING

Surfaces shall be cleaned by HEPA vacuum andadequately wet wiped prior to establishment of containment.

3.6 METHODS OF COMPLIANCE

3.6.1 Mandated Practices

The Contractor shall employ proper handling procedures in accordance with 29 CFR 1926 and 40 CFR 61, Subpart M, and the specified requirements. The specific abatement techniques and items identified shall be detailed in the Contractor's Asbestos Hazard Abatement Plan including, but not limited to, details of construction materials, equipment, and handling procedures. The Contractor shall use the following engineering controls and work practices in all operations, regardless of the levels of exposure:

- a. Vacuum cleaners equipped with HEPA filters to collect debris and dust containing ACM.
- b. Wet methods or wetting agents to control employee exposures during asbestos handling, mixing, removal, cutting, application, and cleanup; except where it can be demonstrated that the use of wet methods is unfeasible due to, for example, the creation of electrical hazards, equipment malfunction, and in roofing.
- c. Prompt clean-up and disposal in leak-tight containers of wastes and debris contaminated with asbestos.
- d. Inspection and repair of polyethylene in work and high traffic areas.
- e. Cleaning of equipment and surfaces of containers filled with ACM prior to removing them from the equipment room or area.

3.6.2 Control Methods

The Contractor shall use the following control methods to comply with the PELs:

- a. Local exhaust ventilation equipped with HEPA filter dust collection systems;
- b. Enclosure or isolation of processes producing asbestos dust;
- c. Ventilation of the regulated area to move contaminated air away from the breathing zone of employees and toward a filtration or collection device equipped with a HEPA filter;
- d. Use of other work practices and engineering controls;
- e. Where the feasible engineering and work practice controls described above are not sufficient to reduce employee exposure to or below the PELs, the Contractor shall use them to reduce employee exposure to the lowest levels attainable by these controls and shall supplement them by the use of respiratory protection that complies with paragraph, RESPIRATORY PROTECTION PROGRAM.

3.6.3 Unacceptable Practices

The following work practices and engineering controls shall not be used for work related to asbestos or for work which disturbs ACM, regardless of measured levels of asbestos exposure or the results of initial exposure

assessments:

- a. High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.
- b. Compressed air used to remove asbestos, or materials containing asbestos, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.
- c. Dry sweeping, shoveling, or other dry clean-up of dust and debris containing ACM.
- d. Employee rotation as a means of reducing employee exposure to asbestos.

3.6.4 Class I Work Procedures

In addition to requirements of paragraphs Mandated Practices and Control Methods, the following engineering controls and work practices shall be used:

- a. A Competent Person shall supervise the installation and operation of the control system.
- b. For jobs involving the removal of more than 25 feet or 10 square feet of TSI or surfacing material, the Contractor shall place critical barriers over all openings to the regulated area.
- c. HVAC systems shall be isolated in the regulated area by sealing with a double layer of plastic or air-tight rigid covers.
- d. Impermeable dropcloths (6 mil or greater thickness) shall be placed on surfaces beneath all removal activity.
- e. Objects within the regulated area shall be handled as specified in paragraph OBJECTS.
- f. Where a negative exposure assessment has not been provided or where exposure monitoring shows the PEL was exceeded, the regulated area shall be ventilated to move contaminated air away from the employee's breathing zone toward a HEPA unit or collection device.

3.6.5 Specific Control Methods for Class I Work

In addition to requirements of paragraph Class I Work Procedures, Class I asbestos work shall be performed using the control methods identified in the subparagraphs below.

3.6.5.1 Negative Pressure Enclosure (NPE) System

The NPE system shall be as shown in SETUP DETAIL SHEET [2] [3] [4] [8]. The system shall provide at least 4 air changes per hour inside the containment. The local exhaust unit equipment shall be operated 24 hours per day until the containment is removed, and shall be leak-proof to the filter and equipped with HEPA filters. Air movement shall be directed away from the employees and toward a HEPA filtration device. The NPE shall be smoke tested for leaks at the beginning of each shift. Local exhaust

equipment shall be sufficient to maintain a minimum pressure differential of minus 0.02 inch of water column relative to adjacent, unsealed areas. Pressure differential shall be monitored continuously, 24 hours per day, with an automatic manometric recording instrument. Pressure differential recordings shall be provided daily on the same day collected. Readings shall be reviewed by the Contractor's Designated Competent Person and IH prior to submittal. The Contracting Officer shall be notified immediately if the pressure differential falls below the prescribed minimum. The building ventilation system shall not be used as the local exhaust system for the regulated area. The local exhaust system shall terminate outdoors unless an alternate arrangement is allowed by the Contract Officer. All filters used shall be new at the beginning of the project and shall be periodically changed as necessary and disposed of as ACM waste.

3.6.5.2 Glovebag Systems

Glovebag systems shall be as shown in SETUP DETAIL SHEET 10. The glovebag system shall be used to remove ACM from straight runs of piping and elbows and other connections. Glovebags shall be used without modification and shall be smoke-tested for leaks and any leaks sealed prior to use. Glovebags shall be installed to completely cover the circumference of pipe or other structures where the work is to be done. Glovebags shall be used only once and shall not be moved. Glovebags shall not be used on surfaces that have temperatures exceeding 150 degrees F. Prior to disposal, glovebags shall be collapsed by removing air within them using a HEPA vacuum. Before beginning the operation, loose and friable material adjacent to the glovebag operation shall be wrapped and sealed in 2 layers of plastic or otherwise rendered intact. At least 2 persons shall perform Class I glovebag removal. Asbestos regulated work areas shall be established as specified and shown on detailed drawings and plans for glovebag abatement. Designated boundary limits for the asbestos work shall be established with rope or other continuous barriers and all other requirements for asbestos control areas shall be maintained, including area signage and boundary warning tape as specified in SET-UP DETAIL SHEET 11.

- a. In addition to requirements for negative pressure glovebag systems above, the Contractor shall attach HEPA vacuum systems or other devices to the bag to prevent collapse during removal of ACM from straight runs of piping and elbows and other connections.
- b. The negative pressure glove boxes used to remove ACM from pipe runs shall be fitted with gloved apertures and a bagging outlet and constructed with rigid sides from metal or other material which can withstand the weight of the ACM and water used during removal. A negative pressure shall be created in the system using a HEPA filtration system. The box shall be smoke tested for leaks prior to each use.

3.6.5.3 Mini-Enclosures

Single bulkhead containment, Double bulkhead containment or Mini-containment (small walk-in enclosure) as shown in SETUP DETAIL SHEET 5, 6 or 7 to accommodate no more than 2 persons, may be used if the disturbance or removal can be completely contained by the enclosure with the following specifications and work practices. The mini-enclosure shall be inspected for leaks and smoke tested before each use. Air movement shall be directed away from the employee's breathing zone within the mini-enclosure.

3.6.5.4 Wrap and Cut Operation

Wrap and cut operations shall be as shown in SETUP DETAIL SHEET 9B or 10. Prior to cutting pipe, the asbestos-containing insulation shall be wrapped with polyethylene and securely sealed with duct tape to prevent asbestos becoming airborne as a result of the cutting process. The following steps shall be taken: install glovebag, strip back sections to be cut 6 inches from point of cut, and cut pipe into manageable sections.

3.6.6 Class II Work

In addition to the requirements of paragraphs Mandated Practices and Control Methods, the following engineering controls and work practices shall be used:

- a. A Competent Person shall supervise the work.
- b. For indoor work, critical barriers shall be placed over all openings to the regulated area.
- c. Impermeable dropcloths shall be placed on surfaces beneath all removal activity.

3.6.7 Specific Control Methods for Class II Work

In addition to requirements of paragraph Class II Work, Class II work shall be performed using the following methods:

3.6.7.1 Vinyl and Asphalt Flooring Materials

When removing vinyl and asphalt flooring materials which contain ACM, the Contractor shall use the following practices as shown in RESPONSE ACTION DETAIL SHEET [56] [57] [58] [59] [60] [61] [62] [63] [64]. Resilient sheeting shall be removed by adequately wet methods. Tiles shall be removed intact (if possible); wetting is not required when tiles are heated and removed intact. Flooring or its backing shall not be sanded. Scraping of residual adhesive and/or backing shall be performed using wet methods. Mechanical chipping is prohibited unless performed in a negative pressure enclosure. Dry sweeping is prohibited. The Contractor shall use vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (no brush) to clean floors.

3.6.7.2 Roofing Material

No exterior renovation work is required in this contract. However, if there is a need for such work, the Contractor shall verify with the COR. When removing roofing materials which contain ACM as described in 29 CFR 1926, Section .1101(g)(8)(ii), the Contractor shall use the following practices as shown in RESPONSE ACTION DETAIL SHEET [74] [75]. Roofing material shall be removed in an intact state. Wet methods shall be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless such wet methods are not feasible or will create safety hazards. When removing built-up roofs, with asbestos-containing roofing felts and an aggregate surface, using a power roof cutter, all dust resulting from the cutting operations shall be collected by a HEPA dust collector, or shall be HEPA vacuumed by vacuuming along the cut line. Asbestos-containing roofing material shall not be dropped or thrown to the ground, but shall be lowered to the ground via covered, dust-tight chute, crane, hoist or other method approved by the Contracting Officer. Any ACM

that is not intact shall be lowered to the ground as soon as practicable, but not later than the end of the work shift. While the material remains on the roof it shall be kept wet or placed in an impermeable waste bag or wrapped in plastic sheeting. Intact ACM shall be lowered to the ground as soon as practicable, but not later than the end of the work shift. Unwrapped material shall be transferred to a closed receptacle precluding the dispersion of dust. Critical barriers shall be placed over roof level heating and ventilation air intakes.

3.6.7.3 Cementitious Siding and Shingles or Transite Panels

No exterior renovation work is required in this contract. However, if there is a need for such work, the Contractor shall verify with the COR. When removing cementitious asbestos-containing siding, shingles or transite panels the Contractor shall use the following practices shown in RESPONSE ACTION DETAIL SHEET [81] [82] [83]. Intentionally cutting, abrading or breaking siding, shingles, or transite panels is prohibited. Each panel or shingle shall be sprayed with amended water prior to removal. Nails shall be cut with flat, sharp instruments. Unwrapped or unbagged panels or shingles shall be immediately lowered to the ground via covered dust-tight chute, crane or hoist, or placed in an impervious waste bag or wrapped in plastic sheeting and lowered to the ground no later than the end of the work shift.

3.6.7.4 Gaskets

Gaskets shall be thoroughly wetted with amended water prior to removal and immediately placed in a disposal container. If a gasket is visibly deteriorated and unlikely to be removed intact, removal shall be undertaken within a glovebag. Any scraping to remove residue shall be performed wet.

3.6.7.5 Other Class II Jobs

The Contractor shall use the following work practices when performing Class II: The material shall be thoroughly wetted with amended water prior and during its removal. The material shall be removed in an intact state. Cutting, abrading or breaking the material is prohibited. The ACM removed shall be immediately bagged or wrapped.

3.6.8 Not Use

3.6.9 Not Use

3.6.10 Alternative Methods for Roofing Materials and Asphaltic Wrap

No exterior renovation work is required in this contract. However, if there is a need for such work, the Contractor shall verify with the COR. The Contractor shall use the following engineering controls and work practices when removing, repairing, or maintaining intact pipeline asphaltic wrap, or roof cements, mastics, coatings, or flashings which contain asbestos fibers encapsulated or coated by bituminous or resinous compounds. If during the course of the job the material does not remain intact, the Contractor shall use the procedures described in paragraph Roofing Material. Before work begins, and as needed during the job, the Designated Competent Person shall conduct an inspection and determine that the roofing material is intact and will likely remain intact. The material shall not be sanded, abraded, or ground. Manual methods which would render the material non-intact shall not be used. Roofing material shall not be dropped or thrown to the ground but shall be lowered via covered, dust-tight chute, crane, hoist or other

method approved by the Contracting Officer. All such material shall be removed from the roof as soon as practicable, but not later than the end of the work shift. Removal or disturbance of pipeline asphaltic wrap shall be performed using wet methods.

3.6.11 Cleaning After Asbestos Removal

After completion of all asbestos removal work, surfaces from which ACM has been removed shall be wet wiped or sponged clean, or cleaned by some equivalent method to remove all visible residue. Run-off water shall be collected and filtered through a dual filtration system. A first filter shall be provided to remove fibers 20 micrometers and larger, and a final filter provided that removes fibers 5 micrometers and larger. After the gross amounts of asbestos have been removed from every surface, remaining visible accumulations of asbestos on floors shall be collected using plastic shovels, rubber squeegees, rubber dustpans, and HEPA vacuum cleaners as appropriate to maintain the integrity of the regulated area. When TSI and surfacing material has been removed, workmen shall use HEPA vacuum cleaners to vacuum every surface. Surfaces or locations which could harbor accumulations or residual asbestos dust shall be checked after vacuuming to verify that no asbestos-containing material remains; and shall be re-vacuumed as necessary to remove the ACM.

3.6.12 Class I Asbestos Work Response Action Detail Sheets

No renovation work involved Class I is required in this contract. However, if Class I work is encountered, the Contractor shall stop work and notify the COR immediately. The following Class I Asbestos Work Response Action Detail Sheet is specified on Table 1 for each individual work task to be performed:

- a. Troweled Wall Plaster on Masonry: See Sheet 32
- b. Troweled Wall Plaster on Stud Wall: See Sheet 33
- c. Troweled Ceiling Plaster on Structural Substrate: See Sheet 35
- d. Troweled Ceiling Plaster on Hung Ceiling: See Sheet 36
- e. Acoustical Wall Plaster on Masonry: See Sheet 42
- f. Acoustical Ceiling Plaster (Non-Asbestos Substrate): See Sheet 44
- g. Asbestos Decorative Paint on Plaster: See Sheet 46
- h. Asbestos-contaminated Masonry for Masonry Chimney: See Sheet 50
- i. Asbestos-contaminated Masonry Wall or Thermal Insulation: See Sheet 51
- j. Fireproofing or Thermal Surface Insulation: See Sheet 68
- k. Acoustical Ceiling Insulation: See Sheet 70
- l. Exterior Asbestos Stucco: See Sheet 79
- m. Duct Insulation: Duct work insulation removal shall not begin without the written authorization of the Contracting Officer stating that the HVAC system to be worked on is either isolated or

inoperative and locked out of service. Forced air circulation is not permitted in ductwork while abatement work is in progress. See Sheet 101

- n. Pipe Insulation (Using a Glovebag): See Sheet 87
- o. Horizontal Pipe Insulation (Using a Containment Area): See Sheet 88
- p. Pipe Insulation (Using a Mini-Containment Area): See Sheet 89
- q. Storage Tank and Boiler Breeching Insulation: See Sheet 93. Written approval shall be obtained from the Contracting Officer before start of work on tanks and boiler breeching. The Contracting Officer will ensure that tanks and boilers have been valved off or shut down and allowed a sufficient amount of time to cool down. Insulation shall be sprayed with a mist of amended water or removal encapsulant. Amended water or removal encapsulant shall be allowed to saturate material to substrate. Bands or wires holding breeching or insulation to equipment shall be cut. Cover jackets shall be slit at seams, and sections removed and hand-placed in a polyethylene disposable bag. Exposed surfaces shall be continuously sprayed with amended water to minimize airborne dust. Insulation on tanks and boiler breeching shall not be allowed to drop to the floor. Residue shall be removed from tank and boiler surfaces. A water stream shall be used to dislodge insulation in joints or irregular spaces that cannot be reached with tools. Lagging on piping and insulation on fittings shall be removed. A penetrating encapsulant shall be sprayed on all exposed tank, boiler and boiler breeching surfaces.
- r. Troweled Wall Plaster on Studs: See Sheet 30
- s. Troweled Ceiling or Wall Plaster on Masonry: See Sheet 31
- t. Acoustical Ceiling on Wall Plaster: See Sheet 41
- u. Interior Stucco: See Sheet 78
- v. Exterior Stucco: See Sheet 80
- w. Pipe and Fitting Insulation (using Glovebag): See Sheet 86
- x. Storage Tank and Boiler Breeching: See Sheet 92
- y. Duct Insulation: See Sheet 100.

3.6.13 Class II Asbestos Work Response Action Detail Sheets

The following Class II Asbestos Work Response Action Detail Sheet is listed for information ONLY. Only one or two Response Action Detail Sheets listed below are applicable for this contract and it shall be listed in the TABLE 1 for quantity verification with the COR per par. 1.3 DESCRIPTION.

- a. Light Curtain: See Sheet 47
- b. Interior Asbestos Cement, Fiberboard and Drywall Panels: See Sheet 48

- c. Suspended Asbestos Cement Ceiling Tile: See Sheet 52
- d. Asbestos Cement Architectural Products: See Sheet 53
- e. Glued-on Acoustical Ceiling and Wall Tile: See Sheet 55
- f. Suspended Acoustical Ceiling Tile: See Sheet 54
- g. Vinyl or Vinyl Asbestos Tile Adhered to Concrete Floor System by Asbestos-Containing Adhesive: See Sheet 56
- h. Vinyl or Vinyl Asbestos Tile Adhered to Wood Floor System by Asbestos Containing Adhesive: See Sheet 60
- i. Vinyl Asbestos Tile Adhered to Concrete Floor System by Asbestos Containing Adhesive: See Sheet 57
- j. Vinyl Asbestos Tile Adhered to Concrete Floor System by Asbestos Free Adhesive: See Sheet 58
- k. Vinyl Asbestos Tile and Chemical Dissolution of Asbestos-Containing Adhesives on Concrete Floor System: See Sheet 59
- l. Vinyl Asbestos Tile Adhered to Wood Floor System by Asbestos-Containing Adhesive: See Sheet 61
- m. Vinyl Asbestos Tile Adhered to Wood Floor System by Asbestos Free Adhesive: See Sheet 62
- n. Sheet Flooring Adhered Wood Floor System: See Sheet 63
- o. Asbestos-Containing Sheet Flooring Adhered to Concrete Floor System by Asbestos-Containing Adhesive: See Sheet 64
- p. Carpeting (Asbestos-Containing or Contaminated): See Sheet 65
- q. Miscellaneous Asbestos-Containing Materials: See Sheet 45
- r. Built-Up Roofing and Flashing: See Sheet 74
- s. Roof, Shingles and Underlayment: See Sheet 75
- t. Asbestos Cement Siding: See Sheet 81
- u. Asbestos Cement Roofing: See Sheet 82
- v. Asbestos-Containing Walkway Cover: See Sheet 83
- w. Asbestos-Contaminated Metal Siding: See Sheet 84
- x. Asbestos Cement Sunscreen Louvers: See Sheet 85
- y. Electrical Wiring and Fixtures: See Sheet 95
- z. Asbestos Insulated Electrical Fixture: See Sheet 96
- aa. Boiler Firebox Insulation: The asbestos-containing boiler firebox lining shall be removed from out-of-service boilers before

the boiler is dismantled: See Sheet 97.

3.6.14 Abatement of Asbestos Contaminated Soil

This paragraph will only be applicable when spillage of ACM waste and remediation is required by the Contractor. [Asbestos contaminated soil shall be removed from areas to a minimum depth of [2] [_____] inches. Soil shall be thoroughly dampened with amended water and then removed by manual shoveling into labeled containers. The workers shall be closely monitored for heat exhaustion. The minimum ventilation shall be 8 air changes per hour through a local exhaust HEPA system. See DETAIL SHEET 73.] [The Contractor has the option to propose encapsulation of soil instead of removal. Since soil encapsulation is highly dependent on soil chemistry, available skills for application and proprietary products, the Contractor shall first test the proposed soil encapsulant on a minimum 100 square feet of soil area onsite. The test shall be witnessed by the Contracting Officer's and the manufacturer's representative. A written application for encapsulation shall be submitted to the Contracting Officer with test results, encapsulant manufacturer's positive recommendation for use, a guarantee for satisfactory performance for 10 years, and limitation of application. The Contracting Officer reserves the right to accept or reject the application with no effect to the contract. If the application is accepted, the soil encapsulation shall proceed in compliance with all provisions and instructions of the encapsulant manufacturer and under the supervision of a person certified by the manufacturer who is trained and experienced in the proper application of the soil encapsulant. See DETAIL SHEET 72.] [A concrete slab of minimum [2] [_____] inch thickness shall be poured over the entire soil surface. Soil surface shall be thoroughly dampened before pouring concrete. Soil encapsulators and supervisors shall be primarily concrete workers trained to work in asbestos contaminated environments. See DETAIL SHEET 71.]

3.6.15 Not Use

3.6.16 Encapsulation of ACM

Prior to applying any encapsulant, the entire surface area shall be inspected for loose, or damaged asbestos material:

- a. Penetrating Encapsulation: Before penetrating encapsulation is applied, asbestos removal work in the area shall be complete and the surfaces to be encapsulated shall be free of loose or damaged material. Substrate shall be evaluated before application to ensure that the encapsulant will not cause the substrate to fail in any way. Acoustical wall and ceiling plaster surfaces shall be encapsulated in accordance with manufacturer's recommendations. Plug samples shall be taken to determine if full penetration has been achieved. If full penetration has not been achieved, surfaces shall be recoated while the matrix is still wet, until full penetration is achieved: See Detail Sheet 39.
- b. Bridging Encapsulation: Prior to applying the bridging encapsulant, the pre-encapsulation inspection shall be performed. The surface shall be encapsulated in sections of 1000 square feet or less as recommended by the encapsulant manufacturer. Upon completion of each section, the dry thickness of the bridging encapsulation shall be measured. Additional bridging encapsulant shall be applied to obtain the desired encapsulant thickness. Additional coats shall blend with the original bridging

encapsulant. Bridging encapsulation shall include:

- (1) Troweled Wall Plaster: See Detail Sheet 29
- (2) Troweled Ceiling Plaster: See Detail Sheet 34
- (3) Acoustical Wall Plaster: See Detail Sheet 38
- (4) Acoustical Ceiling Plaster: See Detail Sheet 34
- (5) Asbestos Cement Wall, Fiberboard and Drywall Panels: See Detail Sheet 49
- (6) Exterior Asbestos Stucco: See Detail Sheet 76
- (7) Interior Asbestos Stucco: See Detail Sheet 77
- (8) Storage Tank and Boiler Breeching: See Detail Sheet 91
- (9) Boiler and Piping Gasket: See Detail Sheet 98.

3.6.17 Combination Encapsulation of Acoustical Wall and Ceiling Plaster

The combination penetrating/bridging encapsulation system shall be installed by first applying the penetrating encapsulant and then the bridging encapsulant: See Detail Sheet 40.

3.6.18 Response Action Detail Sheets for Repair of Class I Materials

- a. Troweled Wall Plaster on Studs: See Detail Sheet 30
- b. Troweled Ceiling or Wall Plaster on Masonry: See Detail Sheet 31
- c. Acoustical Ceiling on Wall Plaster: See Detail Sheet 41
- d. Interior Stucco: See Detail Sheet 78
- e. Exterior Stucco: See Detail Sheet 80
- f. Pipe and Fitting Insulation (using Glovebag): See Detail Sheet 86
- g. Storage Tank and Boiler Breeching: See Detail Sheet 92
- h. Duct Insulation: See Detail Sheet 100
- i. Exposed Pipe Insulation Edges: Asbestos insulation to remain shall have exposed edges contained; the following steps shall be performed: Wet and cut the rough ends true and square with sharp tools and then encapsulate the edges with a 1/4 inch thick layer of non-asbestos-containing insulating cement troweled to a smooth hard finish; when cement is dry, lag the end with a layer of non-asbestos lagging cloth, overlapping the existing ends by 4 inches.

3.6.19 Response Action Detail Sheets for Repair of Class II Materials

- a. Vinyl or Vinyl Asbestos Tile Adhered to Concrete Floor System by Asbestos-Containing Adhesive: See Detail Sheet 56
- b. Vinyl or Vinyl Asbestos Tile Adhered to Wood Floor System by Asbestos Containing Adhesive: See Detail Sheet 60.

3.6.20 Not Use

3.6.21 Sealing Contaminated Items Designated for Disposal

Contaminated architectural, mechanical, and electrical appurtenances such as Venetian blinds, full height partitions, carpeting, duct work, pipes and fittings, radiators, light fixtures, conduit panels, and other contaminated items designated for removal shall be coated with an asbestos lockdown encapsulant at the demolition site before being removed from the asbestos control area. These items shall be vacuumed prior to application of the lockdown encapsulant. The asbestos lockdown encapsulant shall be tinted a contrasting color and shall be spray applied by airless method. Thoroughness of sealing operation shall be visually gauged by the extent of colored coating on exposed surfaces.

3.7 FINAL CLEANING AND VISUAL INSPECTION

Upon completion of abatement, the regulated area shall be cleaned by collecting, packing, and storing all gross contamination; see SET-UP DETAIL SHEETS 9, 14 and 20. A final cleaning shall be performed using HEPA vacuum and wet cleaning of all exposed surfaces and objects in the regulated area. Upon completion of the cleaning, the Contractor shall conduct a visual pre-inspection of the cleaned area in preparation for a final inspection before final air clearance monitoring and recleaning, as necessary. Upon completion of the final cleaning, the Contractor and the Contracting Officer shall conduct a final visual inspection of the cleaned regulated area in accordance with ASTM E 1368 and document the results on the Final Cleaning and Visual Inspection as specified on the SET-UP DETAIL SHEET 19. If the Contracting Officer rejects the clean regulated area as not meeting final cleaning requirements, the Contractor shall reclean as necessary and have a follow-on inspection conducted with the Contracting Officer. Recleaning and follow-up reinspection shall be at the Contractor's expense.

3.8 LOCKDOWN

Prior to removal of plastic barriers and after clean-up of gross contamination and final visual inspection, a post removal (lockdown) encapsulant shall be spray applied to ceiling, walls, floors, and other surfaces in the regulated area.

3.9 EXPOSURE ASSESSMENT AND AIR MONITORING

3.9.1 General Requirements For Exposure

Exposure assessment, air monitoring and analysis of airborne concentration of asbestos fibers shall be performed in accordance with 29 CFR 1926, Section .1101, the Contractor's air monitoring plan, and as specified. Personal exposure air monitoring (collected at the breathing zone) that is representative of the exposure of each employee who is assigned to work within a regulated area shall be performed by the Contractor's Designated IH.

Breathing zone samples shall be taken for at least 25 percent of the workers in each shift, or a minimum of 2, whichever is greater. Air monitoring results at the 95 percent confidence level shall be calculated as shown in Table 2 at the end of this section. The Contractor shall have a third party independent testing laboratory with qualified analysts and appropriate equipment to conduct sample analyses of air samples using the methods prescribed in 29 CFR 1926, Section .1101, to include NIOSH 84-100 Method 7400. Preabatement and abatement environmental air monitoring shall

be performed by the Contractor's Designated IH. Final clearance environmental air monitoring, shall be performed by the Contractor's Designated IH. Environmental and final clearance air monitoring shall be performed using NIOSH 84-100 Method 7400 (PCM) with optional confirmation of results by NIOSH 84-100 Method 7402 (TEM). For environmental and final clearance, air monitoring shall be conducted at a sufficient velocity and duration to establish the limit of detection of the method used at 0.005 f/cc. Confirmation of asbestos fiber concentrations (asbestos f/cc) from environmental and final clearance samples collected and analyzed by NIOSH 84-100 Method 7400 (total f/cc) may be conducted using TEM in accordance with NIOSH 84-100 Method 7402. When such confirmation is conducted, it shall be from the same sample filter used for the NIOSH 84-100 Method 7400 PCM analysis. For all Contractor required environmental or final clearance air monitoring, confirmation of asbestos fiber concentrations, using NIOSH 84-100 Method 7402, shall be at the Contractor's expense. Monitoring may be duplicated by the Government at the discretion of the Contracting Officer. Results of breathing zone samples shall be posted at the job site and made available to the Contracting Officer. The Contractor shall maintain a fiber concentration inside a regulated area less than or equal to 0.1 f/cc expressed as an 8 hour, time-weighted average (TWA) during the conduct of the asbestos abatement. If fiber concentration rises above 0.1 f/cc, work procedures shall be investigated with the Contracting Officer to determine the cause. At the discretion of the Contracting Officer, fiber concentration may exceed 0.1 f/cc but shall not exceed 1.0 f/cc expressed as an 8-hour TWA. The Contractor's workers shall not be exposed to an airborne fiber concentration in excess of 1.0 f/cc, as averaged over a sampling period of 30 minutes. Should either an environmental concentration of 1.0 f/cc expressed as an 8-hour TWA or a personal excursion concentration of 1.0 f/cc expressed as a 30-minute sample occur inside a regulated work area, the Contractor shall stop work immediately, notify the Contracting Officer, and implement additional engineering controls and work practice controls to reduce airborne fiber levels below prescribed limits in the work area. Work shall not restart until authorized by the Contracting Officer.

3.9.2 Initial Exposure Assessment

The Contractor's Designated IH shall conduct an exposure assessment immediately before or at the initiation of an asbestos abatement operation to ascertain expected exposures during that operation. The assessment shall be completed in time to comply with the requirements which are triggered by exposure data or the lack of a negative exposure assessment, and to provide information necessary to assure that all control systems planned are appropriate for that operation. The assessment shall take into consideration both the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of the Contractor which indicate the levels of airborne asbestos likely to be encountered on the job. For Class I asbestos work, until the employer conducts exposure monitoring and documents that employees on that job will not be exposed in excess of PELs, or otherwise makes a negative exposure assessment, the Contractor shall presume that employees are exposed in excess of the PEL-TWA and PEL-Excursion Limit.

3.9.3 Negative Exposure Assessment

The Contractor shall provide a negative exposure assessment for the specific asbestos job which will be performed. The negative exposure assessment shall be provided prior to abatement and conform to the

following criteria:

- a. Objective Data: Objective data demonstrating that the product or material containing asbestos minerals or the activity involving such product or material cannot release airborne fibers in concentrations exceeding the PEL-TWA and PEL-Excursion Limit under those work conditions having the greatest potential for releasing asbestos.
- b. Prior Asbestos Jobs: Where the Contractor has monitored prior asbestos jobs for the PEL and the PEL-Excursion Limit within 12 months of the current job, the monitoring and analysis were performed in compliance with asbestos standard in effect; the data were obtained during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the Contractor's current operations; the operations were conducted by employees whose training and experience are no more extensive than that of employees performing the current job; and these data show that under the conditions prevailing and which will prevail in the current workplace, there is a high degree of certainty that the monitoring covered exposure from employee exposures will not exceed the PEL-TWA and PEL-Excursion Limit.
- c. Initial Exposure Monitoring: The results of initial exposure monitoring of the current job, made from breathing zone air samples that are representative of the 8-hour PEL-TWA and 30-minute short-term exposures of each employee. The monitoring covered exposure from operations which are most likely during the performance of the entire asbestos job to result in exposures over the PELs.

3.9.4 Independent Environmental Monitoring

The abatement contractor will provide the third party independent air monitoring contractor with an up-to-date copy of the accepted Asbestos Hazard Abatement Plan, Accident Prevention Plan and pertinent detailed drawings. The air monitoring contractor is required to comply with the abatement contractor's safety and health requirements. The abatement contractor will coordinate all onsite activities with the air monitoring contractor, the COR, and other affected parties as directed by the COR. The abatement contractor will provide the air monitoring contractor with an up-to-date schedule of abatement contractor work activities. The air monitoring contractor will coordinate with the abatement contractor and the COR during the performance Government required air monitoring. The abatement contractor is responsible for performing exposure assessment and personal air monitoring of abatement contractor's work. The air monitoring contractor is responsible for performing these tasks for its employee.]

3.9.5 Preabatement Environmental Air Monitoring

Preabatement environmental air monitoring shall be established prior to the masking and sealing operations for each regulated area to determine background concentrations before abatement work begins. As a minimum, preabatement air samples shall be collected using NIOSH 84-100 Method 7400, PCM at these locations: outside the building; inside the building, but outside the regulated area perimeter; and inside each regulated work area. One sample shall be collected for every 2000 square feet of floor space.

At least 2 samples shall be collected outside the building: at the exhaust of the HEPA unit; and downwind from the abatement site. The PCM samples shall be analyzed within 24 hours; and if any result in fiber concentration greater than 0.01 f/cc, asbestos fiber concentration shall be confirmed using NIOSH 84-100 Method 7402 (TEM).

3.9.6 Environmental Air Monitoring During Abatement

Until an exposure assessment is provided to the Contracting Officer, environmental air monitoring shall be conducted at locations and frequencies that will accurately characterize any evolving airborne asbestos fiber concentrations. The assessment shall demonstrate that the product or material containing asbestos minerals, or the abatement involving such product or material, cannot release airborne asbestos fibers in concentrations exceeding 0.01 f/cc as a TWA under those work conditions having the greatest potential for releasing asbestos. The monitoring shall be at least once per shift at locations including, but not limited to, close to the work inside a regulated area; preabatement sampling locations; outside entrances to a regulated area; close to glovebag operations; representative locations outside of the perimeter of a regulated area; inside clean room; and at the exhaust discharge point of local exhaust system ducted to the outside of a containment (if used). If the sampling outside regulated area shows airborne fiber levels have exceeded background or 0.01 f/cc, whichever is greater, work shall be stopped immediately, and the Contracting Officer notified. The condition causing the increase shall be corrected. Work shall not restart until authorized by the Contracting Officer.

3.9.7 Final Clearance Air Monitoring

Prior to conducting final clearance air monitoring, the Contractor and the Contracting Officer shall conduct a final visual inspection of the regulated area where asbestos abatement has been completed. The final visual inspection shall be as specified in SET-UP DETAIL SHEET 19. Final clearance air monitoring shall not begin until acceptance of the Contractor's final cleaning by the Contracting Officer. The Contractor's Designated IH shall conduct final clearance air monitoring using aggressive air sampling techniques as defined in EPA 560/5-85-024 or as otherwise required by federal or state requirements. The sampling and analytical method used will be NIOSH 84-100 Method 7400 (PCM) and Table 3 with confirmation of results by NIOSH 84-100 Method 7402 (TEM).

3.9.7.1 Final Clearance Requirements, NIOSH PCM Method

For PCM sampling and analysis using NIOSH 84-100 Method 7400, the fiber concentration inside the abated regulated area, for each airborne sample, shall be less than 0.01 f/cc. The abatement inside the regulated area is considered complete when every PCM final clearance sample is below the clearance limit. If any sample result is greater than 0.01 total f/cc, the asbestos fiber concentration (asbestos f/cc) shall be confirmed from that same filter using NIOSH 84-100 Method 7402 (TEM) at Contractor's expense. If any confirmation sample result is greater than 0.01 asbestos f/cc, abatement is incomplete and cleaning shall be repeated. Upon completion of any required recleaning, resampling with results to meet the above clearance criteria shall be done.

3.9.7.2 Not Use

3.9.7.3 Air Clearance Failure

If clearance sampling results fail to meet the final clearance requirements, the Contractor shall pay all costs associated with the required recleaning, resampling, and analysis, until final clearance requirements are met.

3.9.8 Air-Monitoring Results and Documentation

Air sample fiber counting shall be completed and results provided within 24 hours (breathing zone samples), and 72 hours (environmental/clearance monitoring) after completion of a sampling period. The Contracting Officer shall be notified immediately of any airborne levels of asbestos fibers in excess of established requirements. Written sampling results shall be provided within 5 working days of the date of collection. The written results shall be signed by testing laboratory analyst, testing laboratory principal and the Contractor's Designated IH. The air sampling results shall be documented on a Contractor's daily air monitoring log. The daily air monitoring log shall contain the following information for each sample:

- a. Sampling and analytical method used;
- b. Date sample collected;
- c. Sample number;
- d. Sample type: BZ = Breathing Zone (Personal), P = Preabatement, E = Environmental, C = Abatement Clearance;
- e. Location/activity/name where sample collected;
- f. Sampling pump manufacturer, model and serial number, beginning flow rate, end flow rate, average flow rate (L/min);
- g. Calibration date, time, method, location, name of calibrator, signature;
- h. Sample period (start time, stop time, elapsed time (minutes));
- i. Total air volume sampled (liters);
- j. Sample results (f/cc and S/mm square) if EPA methods are required for final clearance;
- k. Laboratory name, location, analytical method, analyst, confidence level. In addition, the printed name and a signature and date block for the Industrial Hygienist who conducted the sampling and for the Industrial Hygienist who reviewed the daily air monitoring log verifying the accuracy of the information.

3.10 CLEARANCE CERTIFICATION

When asbestos abatement is complete, ACM waste is removed from the regulated areas, and final clean-up is completed, the Contracting Officer will certify the areas as safe before allowing the warning signs and boundary warning tape to be removed. After final clean-up and acceptable airborne concentrations are attained, but before the HEPA unit is turned

off and the containment removed, and the approval of the COR, the Contractor shall remove all pre-filters on the building HVAC system and provide new pre-filters. The Contractor shall dispose of such filters as asbestos contaminated materials. HVAC, mechanical, and electrical systems shall be re-established in proper working order. The Contractor and the Contracting Officer shall visually inspect all surfaces within the containment for residual material or accumulated debris. The Contractor shall reclean all areas showing dust or residual materials. The Contracting Officer will certify in writing that the area is safe before unrestricted entry is permitted. The Government will have the option to perform monitoring to certify the areas are safe before entry is permitted.

3.11 CLEANUP AND DISPOSAL

3.11.1 Title to ACM Materials

ACM material resulting from abatement work, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified and in accordance with applicable federal, state and local regulations.

3.11.2 Collection and Disposal of Asbestos

All ACM waste shall be collected and including contaminated wastewater filters, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing, shall be collected and placed in leak-tight containers such as double plastic bags (see DETAIL SHEET 9A); sealed double wrapped polyethylene sheet (see DETAIL 9B); sealed fiberboard boxes (see DETAIL SHEET 9C); or other approved containers. Waste within the containers shall be wetted in case the container is breached. Asbestos-containing waste shall be disposed of at Fort Hood Sanitary Landfill. For temporary storage, sealed impermeable containers shall be stored in an asbestos waste load-out unit or in a storage/transportation conveyance (i.e., dumpster, roll-off waste boxes, etc.) in a manner acceptable to and in an area assigned by the Contracting Officer. Procedure for hauling and disposal shall comply with 40 CFR 61, Subpart M, state, regional, and local standards.

3.11.3 Scale Weight Measurement

Scales used for measurement shall be public scales. Weighing shall be at a point nearest the work at which a public scale is available. Scales shall be standard truck scales of the beam type; scales shall be equipped with the type registering beam and an "over and under" indicator; and shall be capable of accommodating the entire vehicle. Scales shall be tested, approved and sealed by an inspector of the State of Texas. Scales shall be calibrated and resealed as often as necessary and at least once every three months to ensure continuous accuracy. Vehicles used for hauling ACM shall be weighed empty daily at such time as directed and each vehicle shall bear a plainly legible identification mark.

3.11.4 Weigh Bill and Delivery Tickets

Copies of weigh bills and delivery tickets shall be submitted to the Contracting Officer during the progress of the work. The Contractor shall furnish the Contracting Officer scale tickets for each load of ACM weighed and certified. These tickets shall include tare weight; identification mark for each vehicle weighed; and date, time and location of loading and unloading. Tickets shall be furnished at the point and time individual

trucks arrive at the worksite. A master log of all vehicle loading shall be furnished for each day of loading operations. Before the final statement is allowed, the Contractor shall file with the Contracting Officer certified weigh bills and/or certified tickets and manifests of all ACM actually disposed by the Contractor for this contract.

3.11.5 Asbestos Waste Shipment Record

The Contractor shall complete and provide the Contracting Officer final completed copies of the Waste Shipment Record for all shipments of waste material as specified in 40 CFR 61, Subpart M and other required state waste manifest shipment records, within 3 days of delivery to the landfill.

Each Waste Shipment Record shall be signed and dated by the [Contractor] [Contracting Officer], the waste transporter and disposal facility operator.

TABLE 1

INDIVIDUAL WORK TASK DATA ELEMENTS

Sheet _____ of _____

There is a separate data sheet for each individual work task.

1. WORK TASK DESIGNATION NUMBER _____
2. LOCATION OF WORK TASK _____
3. BRIEF DESCRIPTION OF MATERIAL TO BE ABATED: _____
- a. Type of Asbestos _____
- b. Percent asbestos content _____%
4. ABATEMENT TECHNIQUE TO BE USED _____
5. OSHA ASBESTOS CLASS DESIGNATION FOR WORK TASK _____
6. EPA NESHAP FRIABILITY DESIGNATION FOR WORK TASK
Friable _____ Non-friable Category I _____
Non-friable Category II _____
7. FORM _____ and CONDITION OF ACM: GOOD _____ FAIR _____ POOR _____
8. QUANTITY: METERS _____, SQUARE METERS _____
- 8a. QUANTITY: LINEAR FT. _____, SQUARE FT. _____
9. RESPONSE ACTION DETAIL SHEET NUMBER FOR WORK TASK _____
10. SET-UP DETAIL SHEET NUMBERS
FOR WORK TASK _____, _____, _____, _____,
_____, _____, _____, _____.

NOTES:

- (1) Numeric sequence of individual work tasks (1,2,3,4, etc.) for each regulated area. Each category of EPA friability/OSHA class has a separate task.
- (2) Specific location of work (building, floor, area, e.g., Building 1421, 2nd Floor, Rm 201)
- (3) A description of material to be abated (example: horizontal pipe, cement wall panels, tile, stucco, etc.) type of asbestos (chrysotile, amosite, crocidolite, etc.); and % asbestos content.
- (4) Technique to be used: Removal = REM; Encapsulation = ENCAP; Encasement = ENCAS; Enclosure = ENCL; Repair = REP.
- (5) Class designation: Class I, II, III, or IV (OSHA designation).
- (6) Friability of materials: Check the applicable EPA NESHAP friability designation.
- (7) Form: Interior or Exterior Architectural = IA or EA; Mechanical/Electrical = ME.
Condition: Good = G; Fair = F; Poor = P.
- (8) Quantity of ACM for each work task in meters or square meters.
- (8a) Quantity of ACM for each work task in linear feet or square feet.
- (9) Response Action Detail Sheet specifies the material to be abated and the methods to be used. There is only one Response Action Detail Sheet for each abatement task.
- (10) Set-up Detail Sheets indicate containment and control methods used in support of the response action (referenced in the selected Response Action Detail Sheet).

TABLE 2

FORMULA FOR CALCULATION OF THE 95 PERCENT CONFIDENCE LEVEL
 (Reference: NIOSH 7400)

$$\text{Fibers/cc(01.95 percent CL)} = X + [(X) * (1.645) * (CV)]$$

Where: $X = ((E)(AC))/((V)(1000))$

$$E = ((F/Nf) - (B/Nb))/Af$$

CV = The precision value; 0.45 shall be used unless the analytical laboratory provides the Contracting Officer with documentation (Round Robin Program participation and results) that the laboratory's precision is better.

AC = Effective collection area of the filter in square millimeters

V = Air volume sampled in liters

E = Fiber density on the filter in fibers per square millimeter

F/Nf = Total fiber count per graticule field

B/Nb = Mean field blank count per graticule field

Af = Graticule field area in square millimeters

$$TWA = C1/T1 + C2/T2 = Cn/Tn$$

Where: C = Concentration of contaminant

T = Time sampled.

TABLE 3
 NIOSH METHOD 7400
 PCM ENVIRONMENTAL AIR SAMPLING PROTOCOL (NON-PERSONAL)

Sample Location	Minimum No. of Samples	Filter Pore Size (Note 1)	Min. Vol. (Note 2) (Liters)	Sampling Rate (liters/min.)
Inside Abatement Area	0.5/140 Square Meters (Notes 3 & 4)	0.45 microns	3850	2-16
Each Room in 1 Abatement Area Less than 140 Square meters		0.45 microns	3850	2-16
Field Blank	2	0.45 microns	0	0
Laboratory Blank	1	0.45 microns	0	0

Notes:

1. Type of filter is Mixed Cellulose Ester.
2. Ensure detection limit for PCM analysis is established at 0.005 fibers/cc.
3. One sample shall be added for each additional 140 square meters. (The corresponding I-P units are 5/1500 square feet).
4. A minimum of 5 samples are to be taken per abatement area, plus 2 field blanks.

CONTRACTOR SHALL SIGNED AND DATED A CLEARANCE CERTIFICATION OF EACH ABATED
AREA WITH THE CONTRACTING OFFICER REPRESENTATIVE (paragraph 3.10)

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME _____ CONTRACT NO. _____
PROJECT ADDRESS _____
CONTRACTOR FIRM NAME _____
EMPLOYEE'S NAME _____, _____, _____,
(Print) (Last) (First) (MI)

Social Security Number: _____-_____-_____,

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH TYPES OF LUNG DISEASE AND CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NONSMOKING PUBLIC.

Your employer's contract for the above project requires that you be provided and you complete formal asbestos training specific to the type of work you will perform and project specific training; that you be supplied with proper personal protective equipment including a respirator, that you be trained in its use; and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you. The Contractor's Designated Industrial Hygienist will check the block(s) for the type of formal training you have completed. Review the checked blocks prior to signing this certification.

FORMAL TRAINING:

_____ a. For Competent Persons and Supervisors: I have completed EPA's Model Accreditation Program (MAP) training course, "Contractor/Supervisor", that meets this State's requirements.

_____ b. For Workers:
_____ (1) For OSHA Class I work: I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
_____ (2) For OSHA Class II work (where there will be abatement of more than one type of Class II materials, i.e., roofing, siding, floor tile, etc.): I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
_____ (3) For OSHA Class II work (there will only be abatement of one type of Class II material):
_____ (a) I have completed an 8-hour training class on the elements of 29 CFR 1926, Section .1101(k)(9)(viii), in addition to the specific work practices and engineering controls of 29 CFR 1926, Section .1101(g) and hands-on training.
_____ (b) I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
_____ (4) For OSHA Class III work: I have completed at least a 16-hour course consistent with EPA requirements for training of local education agency maintenance and custodial staff at 40 CFR 763, Section .92(a)(2) and the elements of 29 CFR 1926, Section .1101(k)(9)(viii), in addition to the specific work practices and engineering controls at 29 CFR 1926, Section .1101, and hands-on training.

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

_____ (5) For OSHA Class IV work: I have completed at least a 2-hr course consistent with EPA requirements for training of local education agency maintenance and custodial staff at 40 CFR 763, (a)(1), and the elements of 29 CFR 1926, Section .1101(k)(9)(viii), in addition to the specific work practices and engineering controls at 29 CFR 1926, Section .1101(g) and hands-on training.

_____ c. Workers, Supervisors and the Designated Competent Person: I have completed annual refresher training as required by EPA's MAP that meets this State's requirements.

PROJECT SPECIFIC TRAINING:

_____ I have been provided and have completed the project specific training required by this Contract. My employer's Designated Industrial Hygienist and Designated Competent Person conducted the training.

RESPIRATORY PROTECTION:

_____ I have been trained in accordance with the criteria in the Contractor's Respiratory Protection program. I have been trained in the dangers of handling and breathing asbestos dust and in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair and contact lens use policy of my employer.

RESPIRATOR FIT-TEST TRAINING:

_____ I have been trained in the proper selection, fit, use, care, cleaning, maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in the Contractor's Respiratory Program and have received a satisfactory fit. I have been assigned my individual respirator. I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time.

MEDICAL EXAMINATION:

_____ I have had a medical examination within the last twelve months which was paid for by my employer. The examination included: health history, pulmonary function tests, and may have included an evaluation of a chest x-ray. A physician made a determination regarding my physical capacity to perform work tasks on the project while wearing personal protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's Industrial Hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below. The physician determined that there:

_____ were no limitations to performing the required work tasks.

_____ were identified physical limitations to performing the required work tasks.

Date of the medical examination _____

Employee Signature _____ date _____

Contractor's Industrial

Hygienist Signature _____ date _____

-- End of Section --

QUEST

MicroAnalytics

2530 Electronic Lane, Suite 712

Dallas, Texas 75220-1229

Tel 214.351.4441 Fax 214.351.4487

PLM REPORT

NVLAP Lab No. 200249
TDH License No.30-0218

Client: U.S. Army Corps of Engineers
Project: Fort Hood: 4th ID Modularity Project
Project No.: NA

Request No.: 014191
Report Date: 08/23/04
Sample Date: 08/20/04

Identification: Polarized Light Microscopy/Dispersion Staining (PLM/DS)

Test Method: Method 40 CFR, Ch. 1, Part 763, Subpart F, Appendix A

On 08/23/04, four (4) bulk material samples were submitted by Mark Vercoe of US Army Corps of Engineers for PLM/DS analysis. The results are outlined below:

Client No.	Sample Description	Fibrous Components	Asbestos Content
10003-A01	Taupe Paint (A) with White Texture (B), Tan Paper (C), and Pink Drywall (D)	B) 15% Vermiculite C) 98% Cellulose D) 40% Gypsum 10% Cellulose	A) None Detected B) None Detected C) None Detected D) None Detected
10008-A01	White Mastic (A) with Silver Foil (B), Tan Paper (C), and Yellow Insulation (D)	B) 98% Cellulose C) 99% Fiberglass	A) None Detected B) None Detected C) None Detected D) None Detected
10045-A01	Gray Exterior Window Caulk	None	2% Chrysotile
10045-A02	Gray Exterior Window Caulk	None	2% Chrysotile

The EPA test method for bulk analysis (EPA/600/R-93/116) states in paragraph 2.2.2. that "the detection limit for visual estimation is a function of the quantity of the sample analyzed, the nature of matrix interference, sample preparation, and fiber size and distribution. Asbestos may be detected in concentrations of less than one percent by area if sufficient material is analyzed. Samples may contain fibers too small to be resolved by PLM (<0.25 micrometers in diameter) so detection of those fibers by this method may not be possible."

Samples are analyzed by layers, and percentages estimated visually during microscopic examination. Individual analysis sheets available upon request. Results may not be reproduced except in full. This test report relates only to the samples tested, and results must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. Materials containing >1% asbestos are considered by the EPA to be asbestos containing materials, and must be handled as such.

Analyst: Jennifer Jaber

Lab Director: Jennifer D. Jaber

Approved Signatory :



QUEST

MicroAnalytics, Inc.

2530 Electronic Lane, Suite 712

Dallas, Texas 75220-1229

Tel 214.351.4441 Fax 214.351.4487

POINT COUNT REPORT

NVLAP Lab No. 200249

TDH License No. 30-0218

Client: U.S. Army Corps of Engineers

Request No.: 014191B

Project: Fort Hood: 4th ID Modularity Project

Report Date : 8/24/2004

Project No. : NA

Sample Date: 8/20/2004

Identification: Asbestos Bulk Sample Analysis

Test Method: Polarized Light Microscopy/Dispersion Staining(PLM/DS)/

Point Count EPA Method 600/R-93/116

On 08/23/04, one bulk samples were submitted by Mark Vercoe of US Army Corps of Engr. for Point Count analysis.
The results are summarized below:

Client No	Sample Description	Asbestos Content
10003-A01	White Texture (B)	0.00% Asbestos

Asbestos percentage determined by point count.

The asbestos content should be considered when establishing policy regarding these bulk materials.

Results may not be reproduced except in full. This test report relates only to the samples tested, and must not be used to imply endorsement by NVLAP or any agency of the U.S. Government.

Analyst: Jennifer Jaber

Lab Director: Jennifer D. Jaber

Approved Signatory :



SECTION 13282N

METALS ENCOUNTERED IN PAINT DUST DURING CONSTRUCTION
AMENDMENT NO.0002

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z88.2 (1992) Respiratory Protection

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD 6780 (1995; Errata Aug 1996; Rev Ch. 7 - 1997)
Guidelines for the Evaluation and Control
of Lead-Based Paint Hazards in Housing

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1926.103	Respiratory Protection
29 CFR 1926.21	Safety Training and Education
29 CFR 1926.33	Access to Employee Exposure and Medical Records
29 CFR 1926.55	Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.59	Hazard Communication
29 CFR 1926.62	Lead
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and

Operators of Hazardous Waste Treatment,
Storage, and Disposal Facilities

40 CFR 268

Land Disposal Restrictions

40 CFR 745

Lead-Based Paint Poisoning Prevention in
Certain Residential Structures

49 CFR 172

Hazardous Materials Table, Special
Provisions, Hazardous Materials
Communications, Emergency Response
Information, and Training Requirements

49 CFR 178

Specifications for Packagings

UNDERWRITERS LABORATORIES (UL)

UL 586

(1996; Rev thru Apr 2000) High-Efficiency,
Particulate, Air Filter Units

1.2 DEFINITIONS

1.2.1 Action Level

Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8 hour period.

1.2.2 Area Sampling

Sampling of lead concentrations within the lead control area and inside the physical boundaries which is representative of the airborne lead concentrations but is not collected in the breathing zone of personnel (approximately 5 to 6 feet above the floor).

1.2.3 Competent Person (CP)

As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current federal, State, and local regulations and has the authority to take prompt corrective actions to control the lead hazard. A Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene or a Certified Safety Professional (CSP) certified by the Board of Certified Safety Professionals is the best choice.

1.2.4 Contaminated Room

Refers to a room for removal of contaminated personal protective equipment (PPE).

1.2.5 Decontamination Shower Facility

That facility that encompasses a clean clothing storage room, and a contaminated clothing storage and disposal rooms, with a shower facility in between.

1.2.6 High Efficiency Particulate Arrestor (HEPA) Filter Equipment

HEPA filtered vacuuming equipment with a UL 586 filter system capable of

collecting and retaining lead-contaminated particulate. A high efficiency particulate filter demonstrates at least 99.97 percent efficiency against 0.3 micron or larger size particles.

1.2.7 Lead

Metallic lead, inorganic lead compounds, and organic lead soaps. Excludes other forms of organic lead compounds.

1.2.8 Work Control Area

A system of control methods to prevent the spread of dust, paint chips or debris to adjacent areas that may include temporary containment, floor or ground cover protection, physical boundaries, and warning signs to prevent unauthorized entry of personnel. HEPA filtered local exhaust equipment may be used as engineering controls to further reduce personnel exposures or building/outdoor environmental contamination.

1.2.9 Lead Permissible Exposure Limit (PEL)

30 micrograms per cubic meter of air as an 8 hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more than eight hours in a work day, the PEL shall be determined by the following formula:

$$\text{PEL (micrograms/cubic meter of air)} = 400/\text{No. hrs worked per day}$$

1.2.10 Material Containing Paint with Lead, Arsenic, Cadmium, Chromium, Mercury, Nickel, Zinc, and Selenium.

Any material, including paint, which contains RCRA metals as determined by the testing laboratory using a valid test method. The requirements of this section does not apply if no detectable levels of metals are found using a quantitative method for analyzing paint or MCL using laboratory instruments with specified limits of detection (usually 0.01%). An X-Ray Fluorescence (XRF) instrument is not considered a valid test method.

1.2.11 Personal Sampling

Sampling of airborne lead, cadmium, chromium, mercury, arsenic, nickel, zinc, and selenium concentrations within the breathing zone of an employee to determine the 8 hour time weighted average concentration in accordance with 29 CFR 1926. Samples shall be representative of the employees' work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of and centered at the nose or mouth of an employee. Samples shall be collected in accordance with air monitoring using aggressive air sampling techniques as defined in EPA 560/5-85-024 or as otherwise required by Federal requirements. The sampling and analytical method used will be applicable NIOSH Method.

1.2.12 Physical Boundary

Area physically roped or partitioned off around lead control area to limit unauthorized entry of personnel.

1.3 DESCRIPTION

1.3.1 Description of Work

There is no lead-based paint (per HUD definition) encountered during a

survey conducted by U.S. Army Corps of Engineers with the x-ray fluorescent analyzer (AM #0002) for the renovation structures. But some low levels of lead are present in the paint. The construction activities include (AM #0002) removal-disturbing of components contains paint. Typically, in addition to lead, other metals (i.e. mercury, cadmium, chromium, arsenic, nickel, zinc, and selenium) are also present (AM #0002) in paint. Disturbance of paint is anticipated during building interior renovation. Per OSHA, irregardless of the levels of metal concentrations in the paint, it is required to protect workers from exposure to airborne particles that contain metals. The Contractor shall perform air monitoring in accordance with occupational and environmental assessment per OSHA requirements to protect the workers, perform sampling to ensure protection of occupants and environment. (AM #0002) The eight (8) structures at the 4400 block are to be demolished. These buildings contain lead-based paint (LBP) on the wood siding. After abatement per Section(s) 13280 ASBESTOS ABATEMENT, 13284 REMOVAL, RECYCLING AND DISPOSAL OF REGULATED MATERIALS, and segregation, recycling and reuse (metals, glass, plastic, etc.) per Section(s) 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD and 01572 CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT, the Contractor shall obtain a composite building debris from each structure and perform a TCLP RCRA (8) metals analysis. The Contractor shall reference 30 TAC 335.501 through 335.515, Classifying and Coding Industrial Waste and Hazardous Waste for disposal. The non-hazardous waste shall dispose at the Fort Hood sanitary landfill. Hazardous waste shall not be disposed on base. During demolition, the worker exposure assessment is required per OSHA requirements.

1.3.2 Coordination with Other Work

The contractor shall coordinate with work being performed in adjacent areas. Coordination procedures shall be explained in the Plan and shall describe how the Contractor will prevent metals in paint dust exposure to other contractors and/or Government personnel performing work unrelated to lead activities, and occupants in the buildings (in some renovated structures).

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Occupational and Environmental Assessment Data Report (if objective data is used to justify excluding the initial occupational exposure assessment); G

Components Removal Compliance Plan including CP approval (signature, date, and certification number); G

Competent Person qualifications; G

Training Certification of workers and supervisors; G

Waste Management Plan;

Fort Hood Sanitary Landfill approval for renovated debris disposal;

Certification of Medical Examinations;

SD-06 Test Reports

Sampling results; G

Occupational and Environmental Assessment Data Report; G

SD-07 Certificates

Testing laboratory qualifications; G

Occupant Notification; G

Third party consultant qualifications; G

Clearance Certification; G

SD-11 Closeout Submittals

Completed and signed hazardous waste manifest from treatment or disposal facility (unlikely will have hazardous waste); G

Waste turn-in documents or weight tickets for non-hazardous wastes that are disposed of at Fort Hood Sanitary Landfill; G

1.5 QUALITY ASSURANCE

1.5.1 Qualifications

1.5.1.1 Competent Person (CP)

Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph entitled "Competent Person (CP) Responsibilities." Provide documented construction project-related experience with implementation of OSHA's Lead in Construction standard (29 CFR 1926.62) which shows ability to assess occupational and environmental exposure to lead, experience with the use of respirators, personal protective equipment and other exposure reduction methods to protect employee health. Submit proper documentation that the CP is trained, licensed, and certified in accordance with Federal, State of Texas and local laws. The competent person shall be a licensed lead-based paint abatement Supervisor/Project Designer in the State of Texas.

1.5.1.2 Training Certification

Submit a certificate for each worker and supervisor, signed and dated by the accredited training provider, stating that the employee has received the required lead training specified in 29 CFR 1926.62(1) and is certified to perform or supervise deleading, lead removal or demolition activities in the State of Texas.

1.5.1.3 Testing Laboratory

The contractor shall submit the name, address, and telephone number of the

third party independent testing laboratory selected to perform the air and wipe analysis, testing, and reporting of airborne concentrations of lead. Use a laboratory participating in the EPA National Lead Laboratory Accreditation Program (NLLAP) by being accredited by either the American Association for Laboratory Accreditation (A2LA) or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis. Laboratories selected to perform blood lead analysis shall be OSHA approved.

1.5.1.4 Third Party Consultant Qualifications

The Contractor shall submit

the name, address and telephone number of the third party consultant selected to perform the wipe sampling for determining concentrations of lead in dust. Submit proper documentation that the consultant is trained and certified as an inspector technician or inspector/risk assessor by the State of Texas certification and accreditation program.

1.5.2 Requirements

1.5.2.1 Competent Person (CP) Responsibilities

- a. Verify training meets all Federal, State, and local requirements.
- b. Review and approve the **Components Removal Compliance Plan** for conformance to the applicable referenced standards.
- c. Continuously inspect renovation work for conformance with the approved plan.
- d. Perform (or oversee performance of) air sampling. Recommend upgrades or downgrades (whichever is appropriate based on exposure) on the use of PPE (respirators included) and engineering controls.
- e. Ensure work is performed in strict accordance with specifications at all times.
- f. Control work to prevent hazardous exposure to human beings and to the environment at all times.
- g. Supervise final cleaning of the lead control area, take clearance wipe samples if necessary; review clearance sample results and make recommendations for further cleaning.
- h. Certify the conditions of the work as called for elsewhere in this specification.

1.5.2.2 Components Removal Compliance Plan

Before start of renovation activity, the Contractor shall submit a detailed job-specific plan of the work procedures to be used in the disturbance of paint that contains lead, mercury, cadmium, chromium, nickel, zinc, selenium, and arsenic. The plan shall include a sketch showing the location, size, and details of work control areas, critical barriers, physical boundaries, location and details of decontamination facilities, viewing ports, and mechanical ventilation system. Include a description of equipment and materials, work practices, controls and job responsibilities

for each activity from which metals in paint dust are emitted. Include in the plan, eating, drinking, smoking, hygiene facilities and sanitary procedures, interface of trades, sequencing of lead related work, collected waste water and dust containing metals and debris for disposal, air sampling, respirators, personal protective equipment, and a detailed description of the method of containment of the operation to ensure that paint dust is not released outside of the work control area. Include site preparation, cleanup and clearance procedures. Include occupational and environmental sampling, training and strategy, sampling and analysis strategy and methodology, frequency of sampling, duration of sampling, and qualifications of sampling personnel in the air sampling portion of the plan. Include a description of arrangements made among contractors on multicontractor worksites to inform affected employees and to clarify responsibilities to control exposures.

The plan shall be developed by a certified planner/project designer in the State of Texas.

In occupied buildings, the plan shall also include an occupant protection program that describes the measures that will be taken during the work to notify and protect the building occupants.

1.5.2.3 Occupational and Environmental Assessment Data Report

If initial monitoring is necessary, submit occupational and environmental sampling results to the Contracting Officer within three working days of collection, signed by the testing laboratory employee performing the analysis, the employee that performed the sampling, and the CP.

In order to reduce the full implementation of 29 CFR 1926.62, the Contractor shall provide documentation. Submit a report that supports the determination to reduce full implementation of the requirements of 29 CFR 1926.62 and supporting the Components Removal Compliance Plan.

a. The initial monitoring shall represent each job classification, or if working conditions are similar to previous jobs by the same employer, provide previously collected exposure data that can be used to estimate worker exposures per 29 CFR 1926.62. The data shall represent the worker's regular daily exposure to lead for stated work.

b. Submit worker exposure data gathered during the task based trigger operations of 29 CFR 1926.62 with a complete process description. This includes manual demolition, manual scraping, manual sanding, heat gun, power tool cleaning, rivet busting, cleanup of dry expendable abrasives, abrasive blast enclosure removal, abrasive blasting, welding, cutting and torch burning where lead containing coatings are present.

c. The initial assessment shall determine the requirement for further monitoring and the need to fully implement the control and protective requirements including the **Components Removal Compliance Plan** per 29 CFR 1926.62.

1.5.2.4 Medical Examinations

Initial medical surveillance as required by 29 CFR 1926.62 shall be made available to all employees exposed to paint dust that contains lead, mercury, arsenic, cadmium, chromium, nickel, zinc and selenium at any time (1 day) above the action level. Full medical surveillance shall be made

available to all employees on an annual basis who are or may be exposed to lead in excess of the action level for more than 30 days a year or as required by 29 CFR 1926.62. Adequate records shall show that employees meet the medical surveillance requirements of 29 CFR 1926.33, 29 CFR 1926.62 and 29 CFR 1926.103. Provide medical surveillance to all personnel exposed to lead as indicated in 29 CFR 1926.62. Maintain complete and accurate medical records of employees for the duration of employment plus 30 years.

1.5.2.5 Training

Train each employee performing work that disturbs lead, who performs debris disposal, and air sampling operations prior to the time of initial job assignment and annually thereafter, in accordance with 29 CFR 1926.21, 29 CFR 1926.62, and State of Texas and local regulations where appropriate.

1.5.2.6 Respiratory Protection Program

a. Provide each employee required to wear a respirator a respirator fit test at the time of initial fitting and at least annually thereafter as required by 29 CFR 1926.62.

b. Establish and implement a respiratory protection program as required by ANSI Z88.2, 29 CFR 1926.103, 29 CFR 1926.62, and 29 CFR 1926.55.

1.5.2.7 Hazard Communication Program

Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

1.5.2.8 Waste Management

The **Waste Management Plan** be submitted before renovation work of each renovation task and it shall comply with applicable requirements of federal, State, and local hazardous waste regulations. and address:

a. Identification and classification of wastes associated with the work.

b. Estimated quantities of wastes to be generated and disposed of.

c. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Furnish an agreement with Fort Hood Sanitary Landfill to receive the renovation debris.

d. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.

e. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.

f. Spill prevention, containment, and cleanup contingency measures including a health and safety plan to be implemented in accordance with 29 CFR 1926.65.

g. Work plan and schedule for waste containment, removal and disposal. Proper containment of the waste includes using acceptable waste containers (e.g., 55-gallon drums) as well as proper marking/labeling of the containers. Wastes shall be cleaned up and containerized daily.

h. Include any process that may alter or treat waste rendering a hazardous waste non hazardous.

1.5.2.9 Environmental, Safety and Health Compliance

In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of Federal, State, and local authorities regarding lead. Comply with the applicable requirements of the current issue of 29 CFR 1926.62. Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement shall apply.

Licensing and certification] in the State of Texas is required.

1.5.3 Pre-Construction Conference

Along with the CP, meet with the Contracting Officer Representative (COR) to discuss in detail the **WORK PLANS including the Waste Management Plan, and the Components Removal Compliance Plan**, including procedures and precautions for the work.

1.6 EQUIPMENT

1.6.1 Respirators

Furnish appropriate respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust, fume and mist. Respirators shall comply with the requirements of 29 CFR 1926.62.

1.6.2 Special Protective Clothing

Furnish personnel who will be exposed to lead-contaminated dust with proper disposable protective whole body clothing, head covering, gloves, eye, and foot coverings as required by 29 CFR 1926.62. Furnish proper disposable plastic or rubber gloves to protect hands. Reduce the level of protection only after obtaining approval from the CP.

1.6.3 Rental Equipment Notification

If rental equipment is to be used during handling of components with paint and disposal of debris, notify the rental agency in writing concerning the intended use of the equipment.

1.6.4 Vacuum Filters

UL 586 labeled HEPA filters.

1.6.5 Equipment for Government Personnel

Furnish the Contracting Officer Representative (COR) with two complete sets of personal protective equipment (PPE) daily, as required herein, for entry into and inspection of the lead removal work within the lead controlled area. Personal protective equipment shall include disposable whole body covering, including appropriate foot, head, eye, and hand protection. PPE shall remain the property of the Contractor. The Government will provide

respiratory protection for the Contracting Officer.

1.7 PROJECT/SITE CONDITIONS

1.7.1 Protection of Existing Work to Remain

Perform work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better as determined by the COR.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Protection

3.1.1.1 Notification

a. Notify the Contracting Officer as soon as possible prior to the start of any renovation work.

b. Occupant Notification

Submit occupant written acknowledgment of the delivery of lead hazard information pamphlet (EPA 747-K-99-001 "Protect Your Family From Lead in Your Home") prior to commencing the renovation work for each affected unit using language provided in 40 CFR 745 Subpart E.

3.1.1.2 Work Control Area

a. Physical Boundary - Provide physical boundaries around the work control area by roping off the area designated in the work plan or providing curtains, portable partitions or other enclosures to ensure that lead will not escape outside of the lead control area.

b. Warning Signs - Provide warning signs at approaches to work control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

3.1.1.3 Furnishings

The Government will remove furniture and equipment from the renovated area of each building before renovation work begins.

Protect and cover furnishings or any items that is not removable from the renovation area.

3.1.1.4 Heating, Ventilating and Air Conditioning (HVAC) Systems

Shut down, lock out, and isolate HVAC systems that supply, exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with 6 mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area. Provide temporary HVAC system for areas in which HVAC has been shut down outside the control area.

3.1.1.5 Decontamination Shower Facility

Provide clean and contaminated change rooms and shower facilities in accordance with this specification and 29 CFR 1926.62.

3.1.1.6 Eye Wash Station

Where eyes may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.

3.1.1.7 Mechanical Ventilation System

a. To the extent feasible, use local exhaust ventilation or other collection systems, approved by the CP. Local exhaust ventilation systems shall be evaluated and maintained in accordance with 29 CFR 1926.62.

b. Vent local exhaust outside the building and away from building ventilation intakes and ensure system is connected to HEPA filters.

c. Use locally exhausted, power actuated tools or manual hand tools.

3.1.1.8 Personnel Protection

Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking or application of cosmetics is not permitted in the work control area. No one will be permitted in the work control area unless they have been appropriately trained and provided with protective equipment.

3.2 ERECTION

3.2.1 Work Control Area Requirements

Establish a work control area by completely establishing barriers and physical boundaries around the area or structure where components removal operations will be performed.

The Competent Person shall determine the requirement of a Full Containment for each renovation area. The full containment removal operations shall require the use of critical barriers and HEPA filtered exhaust and a negative pressure enclosure system with decontamination facilities and with HEPA filtered exhaust. For containment areas larger than 1,000 square feet install a minimum of two 18 inch square viewing ports. Locate ports to provide a view of the required work from the exterior of the enclosed contaminated area. Glaze ports with laminated safety glass.

3.3 APPLICATION

3.3.1 Work

Perform work in accordance with approved Component Removal Compliance Plan. Use procedures and equipment required to limit occupational exposure and environmental contamination with lead when the work is performed in accordance with 29 CFR 1926.62 and 40 CFR 745, and as specified herein. Dispose of all renovated waste in compliance with Federal, State, and local requirements.

3.3.2 Components Removal

Manual or power sanding or grinding of paint surfaces or materials is not permitted unless tools are equipped with HEPA attachments or wet methods. Provide methodology for removal of components in the Components Removal Compliance Plan. Select removal processes to minimize contamination of work areas outside the control area with paint dust or other metal contaminated debris or waste and to ensure that unprotected personnel are not exposed to metals in paint dust per OSHA guidelines. Describe this removal process in the Components Removal Compliance Plan.

3.3.2.1 Paint Dust with Metals - Indoor Removal

Perform manual and mechanical removal in the work control areas using enclosures, barriers or containments and powered locally exhausted tools. Collect residue and debris with paint for disposal in accordance with Federal, State, and local requirements.

3.3.2.2 Paint Dust with Metals - Outdoor Removal (If Applicable)

Perform outdoor removal as indicated in Federal, State, and local regulations and in the Components Removal Compliance Plan. The worksite preparation (barriers or containments) shall be job dependent and presented in the Components Removal Compliance Plan.

3.3.3 Personnel Exiting Procedures

Whenever personnel exit the controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn in the control area:

- a. Vacuum all clothing before entering the contaminated change room.
- b. Remove protective clothing in the contaminated change room, and place them in an approved impermeable disposal bag.
- c. Shower.
- c. Wash hands and face at the site, don appropriate disposable or uncontaminated reusable clothing, move to an appropriate shower facility, shower.
- d. Change to clean clothes prior to leaving the clean clothes storage area.

3.4 FIELD QUALITY CONTROL

3.4.1 Tests

3.4.1.1 Air and Wipe Sampling

Conduct sampling for lead in accordance with 29 CFR 1926.62 and as specified herein. Air and wipe sampling shall be directed or performed by the CP.

- a. The CP shall be on the job site directing the air and wipe sampling and inspecting the renovation work to ensure that the requirements of the contract have been satisfied during the entire operation.

b. Collect personal air samples on employees who are anticipated to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least twenty-five percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.

c. Submit results of air samples, signed by the CP, within 72 hours after the air samples are taken.

d. Conduct area air sampling daily, on each shift in which lead-based paint removal operations are performed, in areas immediately adjacent to the control area. Sufficient area monitoring shall be conducted to ensure unprotected personnel are not exposed at or above 30 micrograms per cubic meter of air. If 30 micrograms per cubic meter of air is reached or exceeded, stop work, correct the condition(s) causing the increased levels. Notify the Contracting Officer immediately. Determine if condition(s) require any further change in work methods. Removal work shall resume only after the CP and the Contracting Officer give approval.

e. Before any work begins, a third party consultant shall] collect and analyze baseline wipe and soil (if applicable to the renovation activity) samples in accordance with methods defined by federal, State, and local standards inside and outside of the physical boundary to assess the degree of dust contamination in the facility prior to disturbance of paint or removal any painted components.

f. Surface Wipe Samples - Collect surface wipe samples on floors at a location no greater than 10 feet outside the control area at a frequency of once per day while lead removal work is conducted in occupied buildings. Surface wipe results shall meet criteria in paragraph "Clearance Certification."

3.4.1.2 Sampling After Removal

After the visual inspection, conduct soil sampling only if bare soil is present during external removal operations and collect wipe and soil samples according to the HUD protocol contained in HUD 6780 to determine the lead content of settled dust in micrograms per square meter foot of surface area and parts per million (ppm) or for soil.

3.4.1.3 Testing of Waste Material Containing Metals

Test waste in accordance with 40 CFR 261 for TCLP RCRA metals (arsenic, lead, mercury, cadmium, chromium, nickel, zinc, and selenium) per applicable EPA Methods 6010 and 7000 series for disposal. The waste is very likely to be non-hazardous.

3.5 CLEANING AND DISPOSAL

3.5.1 Cleanup

Maintain surfaces of the control area free of accumulations of dust and debris. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use pressurized air to clean up the area. At the end of each shift and when the renovating operation has been completed, clean the controlled area of visible contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping

the area and wet wiping the area as indicated by the Components Removal Compliance Plan. Reclean areas showing dust or debris. After visible dust and debris is removed, wet wipe and HEPA vacuum all surfaces in the controlled area. If adjacent areas become contaminated at any time during the work, clean, visually inspect, and then wipe sample all contaminated areas. The CP shall then certify in writing that the area has been cleaned of dust contamination before clearance testing.

3.5.1.1 Clearance Certification

The CP shall certify in writing that air samples collected outside the work control area during components removal operations are less than 30 micrograms per cubic meter of air; the respiratory protection used for the employees was adequate; the work procedures were performed in accordance with 29 CFR 1926.62; and that there were no visible accumulations of material and dust left in the work site. Do not remove the work control area or roped off boundary and warning signs prior to the COR acknowledgement of receipt of the CP certification.

The third party consultant shall certify surface wipe sample results collected inside and outside the work area are not significantly greater than the initial surface loading determined prior to work.

The third party consultant shall certify surface wipe sample results collected inside and outside the work area are less than 200 micrograms per square foot on floors or horizontal surfaces to ensure occupants in adjacent to the renovated areas are protected.

Certify surface wipe samples are not significantly greater than the initial surface loading determined prior to work.

Clear the control area of all visible dust and debris.

It is very unlikely that exterior work is required for this contract. If exterior renovation work is needed, prior to start work, soil samples shall be taken initially then followed by soil sample taken after components removal. The clearance soil sample shall be used to determine if soil lead levels had increased at a statistically significant level (significant at the 95 percent confidence limit) from the soil lead levels prior to the operation. If soil lead levels either show a statistically significant increase above soil lead levels prior to work or soil lead levels above any applicable Federal or State standard for lead in soil, the soil shall be remediated.

3.5.2 Disposal

a. All material, whether hazardous or non-hazardous shall be disposed in accordance with all laws and provisions and all federal, State or local regulations. Ensure all waste is properly characterized. The result of each waste characterization (TCLP for RCRA materials) will dictate disposal requirements. Each load-out of waste disposed at the landfill shall have a TCLP RCRA metals analysis per applicable EPA Methods 6010 and 7000 series.

b. Contractor is responsible for segregation of waste. Collect waste, scrap, debris, bags, containers, equipment, and paint dust contaminated clothing that may produce airborne concentrations of metals. Label the containers in accordance with 29 CFR 1926.62 and 40 CFR 261.

c. It is very unlikely to encounter hazardous waste. If hazardous waste is encountered, the hazardous waste shall be manifested and disposed at an EPA or State approved hazardous waste treatment, storage, or disposal facility off Government property.

d. Store waste materials in U.S. Department of Transportation (49 CFR 178) approved 55 gallon drums. Properly label each drum to identify the type of waste (49 CFR 172) and the date the drum was filled. For hazardous waste, the collection drum requires marking/labeling in accordance with 40 CFR 262 during the accumulation/collection timeframe. The Contracting Officer or an authorized representative will assign an area for interim storage of waste-containing drums. Do not store hazardous waste drums in interim storage longer than 90 calendar days from the date affixed to each drum.

e. Handle, store, transport, and dispose waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.

3.5.2.1 Disposal Documentation

The Contractor shall turn-in documents or weight tickets for non-hazardous waste disposal.

3.5.2.2 Payment for Waste

Payment for disposal of non-hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of non-hazardous waste delivered is returned and a copy is furnished to the Government.

-- End of Section --

SECTION 13284

REMOVAL, RECYCLING AND DISPOSAL OF REGULATED MATERIALS
AMENDMENT NO.0002

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 82	Protection of Stratospheric Ozone
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 273	Standards for Universal Waste Management
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce and Use Prohibitions
49 CFR 171	General Information, Regulations and Definitions
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

TEXAS ADMINISTRATIVE CODE (TAC)

TAC 335.91 - 335.94 Standards Applicable to Transporters of
Hazardous Waste

U.S. ARMY CORPS OF ENGINEERS (COE)

COE EM 385-1-1 (Current Edition) Safety and Health
Requirements Manual

1.2 DEFINITIONS

1.2.1 Regulated Materials

Regulated materials are arsenic (As), cadmium (Cd), cesium, chlordane, creosote, ethylene glycol, lead (Pb), mercury (Hg), oil and grease, ozone depleting chemicals (ODC), polychlorinated biphenyls (PCB), trichlorobenzene (TCB), diethylhexyl phthalate (DEHP), and tritium.

1.2.2 Arsenic

A solid and poisonous element that is commonly metallic, steel-gray, crystalline, and brittle. A poisonous trioxide of arsenic is used especially as an insecticide or weed killer. Typically, wood utility poles are treated with arsenic trioxide.

1.2.3 Ballast

A ballast is a device used to give starting voltage and/or stabilizing current to a fluorescent light tube. Ballast is a metal case filled with a solid or semisolid asphalt/tar substance that contain a capacitor. The capacitor may contain the following regulated materials: PCB, TCB or DEPH.

PCB was prohibited 1979 per 40 CFR 761. Approximately half of the ballasts made before 1979 contained PCB. "No PCBs" labels have been used to identify ballasts without PCB since 1 July 1978. Therefore all ballasts without "No PCBs" labels, with labels of fabrication on or before 1979 and no known date of fabrication are assumed as PCB ballasts. PCB-ballasts are regulated and disposal at a landfill is prohibited.

Ballasts from 4-foot lighting fixtures made before 1985 and from all other sizes of fixtures made before 1991 contained wet capacitors. The replacement dielectric fluid for PCBs in these wet capacitors is mineral oil and solvents. The hazardous solvents are typically TCB or DEPH. Unless the non-PCB ballasts are made after 1992, they are presumed to contain TCB or DEPH and shall be recycled at a permitted facility.

1.2.4 Cadmium

A bluish, white, malleable, ductile, toxic, bivalent, and metallic element. It is especially used in protective plating, bearing metals, and electrodes for batteries.

1.2.5 Americium

Americium (Am) isotope Am241 has been used as a source of ionization for smoke detector. It is believed to exist in two (2) forms, an alpha form, which has a double hexagonal close-packed structure, and a loss-packed cubic beta form. The alpha activity from Am241 is three times that of

radium and must be handled with great care to avoid human contamination.

1.2.6 Chlordane

It was typically used for treatment of termites in soil around the building foundation and perimeter of structure. Sampling and testing are required for soil disposal.

1.2.7 Creosote

A brownish oily liquid, consisting chiefly of aromatic hydrocarbons. It is obtained by distillation of coal tar and used especially as a wood preservative (i.e. wood utility poles).

1.2.8 Emergency Lights

The emergency lights are operated by a back-up power source such as a battery. Mercury, cadmium, and lead are typically used in batteries.

1.2.9 Fluorescent Light Tube

A light bulb (or tube) of a fluorescent lighting fixture.

1.2.10 Lead

A heavy, soft, malleable, ductile, plastic but inelastic, bluish white, and metallic element. It is found mostly in combination and used especially in pipes, cable sheaths, batteries, solder, and shield against radioactivity.

1.2.11 Lighting Fixture

A unit containing a fluorescent light tube, light reflector, casing and ballast.

1.2.12 Mercury (Hg)

Mercury is a metal that is liquid at room temperature with a small vapor pressure. Mercury-containing items addressed in this specification are thermostats, fluorescent light tubes, and rechargeable battery.

1.2.13 Mercury Bulb Thermostat

A temperature control device containing a mercury ampule attached to a bimetallic sensing element.

1.2.14 Ozone Depleting Chemicals (ODC)

ODC include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halon, tetra (and tri) chloroethane, carbon tetrachloride and all isomers of methyl chloroform. A complete list of ODC are in 40 CFR 82 Subpart A, Appendixes A and B. Items potentially containing ODC's are refrigeration equipment for HVAC systems, freezers, refrigerators, water drinking fountains, ice machines, beverage and refrigerated food dispensers, halon fire extinguishers, and biomedical equipment.

1.2.15 Polychlorinated Biphenyls (PCBs)

PCB are defined in 40 CFR 761. They are oily in pure form. PCBs can enter

the body through lungs, gastrointestinal tract, skin, can circulate through throughout the body, and can be stored in the fatty tissue. Available animal studies indicate an oncogenic potential. PCBs can cause adverse reproductive effects and developmental toxicity in humans. Items containing PCBs in this specification are ballasts and transformers (see definition of Ballast below).

1.2.16 Retorting Mercury

The retorting of mercury is a process whereby mercury is distilled from other materials by using heat. During the fluorescent light tube recycling process, mercury is retorting from phosphor powder that coats the inside of the glass tube.

1.2.17 Transformer

A device employing the principle of mutual induction to convert variations of current in a primary circuit into variations of voltage and current in a secondary circuit. It contains PCB, TCB and/or DEPH. It is pole-mounted or pad-mounted.

1.2.18 Tritium

It is a low radioactive gas, radioactive isotope of hydrogen with atoms of three times the mass of ordinary light hydrogen atoms. It has very low radiotoxicity and is typically used in luminous instrument dials such as lighted exit signs.

1.2.19 Utility Pole

It is typically used for mounting power cable, panel, lighting, control switch, or electrical device such as transformers. An exterior wood pole is typically preserved by pressure treatment with application of arsenic trioxide or creosote.

1.2.20 Heating and Chilling Water

This type of system is used in military installations. It typically contains ethylene glycol (antifreeze), a regulated substance.

1.2.21 Grease Trap

It is commonly installed in dining facility or kitchen. It contains oil and grease sludge. Removal or and discharging to sanitary sewerage system is prohibited.

1.3 DESCRIPTION OF WORK

Work in this section shall begin after abatement of other regulated materials that are stated in other section of this contract. Prior to the start of renovation **(AM #0002) demolition** work, all items containing regulated materials stated in this section shall be removed from the buildings. The Contractor shall determine the items containing regulated materials by knowledge and use the Regulated Materials Schedule (attached with SECTION 01010) to verify the actual quantities of items in each building and each demolition site with the Contracting Officer Representative (COR). All removed items shall be salvaged and recycled to the maximum extent possible or incinerated. Final disposal of regulated

materials in a landfill shall be in accordance with applicable Federal, state, and local regulatory agencies, and when all means of recycling and reuse are exhausted.

1.4 CONTRACTOR'S QUALIFICATIONS

The Contractor and subcontractors shall have at least 2 years experience with battery, thermostats, delisted pesticides and be familiar with Universal Waste Rules in accordance with 40 CFR 273 and Mercury-Containing and Rechargeable Battery Recycling Act, Public Law 104-142, effective since May 13, 1996. The Contractor and subcontractors shall have at least 2 years experience with PCB-containing items and familiar with 40 CFR 761. The Contractor and subcontractors shall have at least at least 2 years experience in purging and reclaiming ODC and certified in accordance with 40 CFR 82. They shall also be familiar with other applicable Federal, state and local regulations for work to be performed in this specification.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor's Qualifications; G.

Documentation of work experience in removal, recycling and/or disposal of items containing regulated material in accordance with paragraph, Contractor's Qualification.

ODC Recovery and Recycling Equipment's Certifications; .

A copy of each ODC recovery and recycling equipment's certification in accordance with 40 CFR 82.158. A written agreement of the fluorescent light tubes recycling facility to transport the packaged fluorescent light tubes.

A copy of certification from each technician reclaiming ODC in accordance with 40 CFR 82.161 and 40 CFR 82.164.

Licenses and Permits; G.

A copy of the recycling/destruction facility license for handling, treatment and/or destruction of ballasts containing PCB, TCB and/or DEPH.

A copy of the RCRA Part B permit for the facility that is retorting mercury on site.

Proof of state registration or a copy of permit for pumping, hauling, and transporting hazardous waste in accordance with TAC 335.91 - 335.94, and EPA permit per 40 CFR 263 if transporting to other state.

Proof of state registration to pump, transport, or recycle grease trap sludge.

Notification of Recycling Activity;.

Contractor is require to notify TNRCC 90 days prior to recycling activity with the form TNRCC-0525, "Generator Notification Form for Recycling Hazardous or Industrial Waste". Furnish a copy to the Contracting Officer.

Spill Prevention Plan; .

A written Spill Prevention Plan shall be prepared in accordance with paragraph SPILLS AND SAFETY of this section shall be submitted at least 30 days before start of work.

Environmental Pollution Liability Insurance; .

A copy of the current environmental pollution liability insurance policy from the Contractor (subcontractors) and the recycling and/or destruction facilities.

SD-11 Closeout Submittals

Closure Report; G.

A report in accordance with Part 3 paragraph CLOSURE REPORT shall be prepared and submitted in 10 working days or prior to final payment after completion of work specified in this section.

Recycling Activity Delivery Receipt; .

The Contractor shall submit to the Contracting Officer a delivery receipt verifying recycling of items to the Contracting Officer. Contractor shall be responsible to manifest in accordance with 40 CFR 261 and 761. Transportation shall be in accordance with 49 CFR 173 and 178.

1.6 LABELING AND RECORD KEEPING

Labeling and record keeping of regulated materials to be salvaged, recycled, incinerated, or placed in a landfill shall be in accordance with 40 CFR 262, 40 CFR 263, 40 CFR 264, and all other applicable Federal, State and local regulations. Bill of lading shall be prepared for each item to be shipped to recycling and/or destruction. Information shall include initial date of storage, generator's name and address, destination address and telephone number and the shipping weight.

1.7 SPILLS AND SAFETY

The Contractor shall prepare, maintain and implement a Spill Prevention Plan. The plan shall establish policies and procedures to prevent spills, minimize spill impact on its surroundings and methods to cleanup. The plan shall encompass all activities including at the site, transportation to recycling and/or destruction facilities. It shall address all the safety and health concerns in accordance with 29 CFR 1926 in event of a spill. It shall address clean-up requirements in accordance with 29 CFR 1910.120 paragraphs (b) through (o). Clean-up personnel shall meet the training requirements of 29 CFR 1910.38 (a); 1910.134; and 1910.1200. As a minimum, the following items shall be addressed in the plan: cleanup of spill by the Contractor; verification and approval of final clearance by the

Contracting Officer; personal protective equipment (PPE) and decontamination procedures; equipment and material required for cleanup; reporting required to notify state, local, and the Contracting Officer verbally and in writing. The plan shall be kept on-site. Spills of one pound or more of PCBs (typically from 16 or more ballasts) shall be reported within 24 hours to National Response Center (1-800-424-8802), the Contracting Officer and cleaned up immediately. The Contractor shall assume full responsibility for compliance with all Federal, state, and local regulations for workers protection, work practices, site safety, transportation and disposal.

1.8 STORAGE

A temporary storage area shall be provided by the Contractor and approved by the Contracting Officer. Storage time limits are 30 days for ballasts containing PCBs (40 CFR 761) and 1 year for thermostats containing Hg (40 CFR 273). All regulated materials must be removed from the site and is satisfactory to the Contracting Officer Representative before final acceptance of this project by the Government.

1.9 TRANSPORTATION

Items containing regulated materials shall be transported by a licensed, hazardous waste hauler. The Spill Prevention Plan shall be enforced by the Contractor to prevent spillage in accordance with 49 CFR 171 and 40 CFR 173.

The hauler shall not store regulated materials longer than 10 days in accordance with 40 CFR 263 and 40 CFR 273. Vehicle loading, vehicle placarding, waste tracking, notification and record keeping shall be in accordance with all applicable Federal, State and local regulations.

1.10 FACILITY FOR RECYCLED MATERIALS

The receiver of the PCB or wet-type (TCB or DEPH) ballasts or transformers shall have a RCRA Part B permit.

1.11 LICENSES AND PERMITS

Contractor shall furnish the licenses and permits listed in Part 1 paragraph SUBMITTALS.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 VERIFICATION OF REGULATED MATERIALS

Prior to initiation of work in this section, the Contractor shall field verify the actual locations, quantities and categories of items containing regulated materials. The Contractor shall notify the Contracting Officer of any discrepancies or conflicts before performing work.

3.2 WASTE MINIMIZATION, SALVAGE, AND RECLAMATION

The Contractor shall segregate wastes to salvage and reclaim all items to their maximum extent and practice waste minimization. The Contractor shall not dispose of any item in its entirety to the landfill or by incineration.

Regulated materials shall be manifested in accordance with 40 CFR 262, unless exemption is justified.

3.3 REMOVAL, HANDLING, AND PACKAGING

Removing, handling, and packaging shall be in accordance with COE EM 385-1-1.

3.3.1 Ballasts

The Contractor shall remove all ballasts from the lighting fixtures and place them into containers for shipping in accordance with 49 CFR 178. Leaking ballasts shall be placed in containers with absorbent material such as vermiculite or other suitable fire-retardant materials. Containers shall have affixed labels such as "Leaking PCB or Non-PCB with TCB or DEPH Ballasts" to state the conditions of the items. Intact ballasts shall be packed and labeled as "PCB or Non-PCB with TCB or DEPH Ballasts" to state the condition of the items. A typical container shall not hold more than 220 ballasts or the total weight of each container shall not exceed 400 kilograms (or 882 pounds). PCB ballast shall be managed in accordance with 40 CFR 761. These containers shall be transported to a permitted facility for incineration or destruction. The Contractor shall turn in these containers by appointment only to the DPW Waste classification Unit, Bldg 1345, located at 37th & North Ave. (telephone 254/288-SNAP). DPW Classification Unit will assist in logistics of containment, packing, waste classification, etc. Reference SECTION 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD.

3.3.2 Lighted Exit Signs, Smoke Detectors, Emergency lights and Rechargeable Batteries

The Contractor shall field verify locations of these items and request DPW Alex Kachura, 254/287-8712 for review and confirmation. They shall be carefully removed and securely packed in separate labeled containers. The container voids shall be filled with vermiculite or other suitable fire-retardant materials. Shipping labels "Used Lighted Exit Signs Contain Tritium (Potential Hazard: Low Radiotoxicity)" and "Smoke Detectors Contain Americium (Potential Hazard: Fire and Explosion Risk)" shall be affixed on containers with the intact components. Emergency lights with used batteries shall be placed in separate container labeled as "Emergency Lights with Used Batteries (Potential Hazard: lead, cadmium, mercury)". Other rechargeable batteries shall be placed in a separate container labeled as "Used Batteries (Potential Hazard: lead, cadmium, mercury)". The containers shall be vented and voids shall be filled with vermiculite or other suitable fire-retardant materials. The Contractor shall turn in these containers by appointment only to the DPW Waste classification Unit, Bldg 1345, located at 37th & North Ave. (telephone 254/288-SNAP). DPW Classification Unit will assist in logistics of containment, packing, waste classification, etc. Reference SECTION 01368 SPECIAL PROJECT PROCEDURES FOR FORT HOOD.

3.3.3 Fluorescent Light Tubes and Lighting Fixtures

The Contractor shall remove the intact fluorescent light tubes from the lighting fixtures and place in the same boxes that held the replacement light tubes or other similar size containers that have box spacers to prevent breakage. Broken tubes shall be placed in containers in accordance with 49 CFR 178 and labeled as "Broken Fluorescent Light Tubes with Mercury." The containers with broken light tubes shall be manifested for transport and disposal in accordance with 40 CFR 262, 40 CFR 263, and 40 CFR 264. Fluorescent light tubes shall be turn-in to the DWP Classification Unit and they will assist in logistics of containment, packing, waste classification, etc. Metallic components of the lighting fixtures shall be

recycled as scrap metal with other metallic components of the building structure. Plastic components of the lighting fixtures shall be segregated and recycled.

3.3.4 Mercury Bulb Thermostats

The Contractor shall remove and handle mercury bulb thermostats in accordance with 40 CFR 273. Leaking or broken ones shall be placed in a container with absorbent such as vermiculite and labeled as " Broken Mercury Bulb Thermostats". Intact bulb thermostats shall be packed and labeled as "Intact Mercury Bulb Thermostats." They shall be turn-in to DPW Classification Unit and they will assist in logistics of containment, packing, waste classification, etc. The items shall be manifested for transportation and disposal in accordance with 40 CFR 262, 40 CFR 263, and 40 CFR 264.

3.3.5 ODC Units and Halon Tanks

The Contractor shall purge the units (i.e. coolers in water fountain) prior to removal from existing locations and handle ODC in accordance with 40 CFR 82 Subpart F. See license requirement in submittal, this section. The salvaged refrigerant shall be contained in 50 pound retrievable containers and recycled through the DPW Supply, Bldg 4406, 77th & warehouse, telephone 254/288-2383. An empty container shall be furnished upon turn-in of the full container and each container shall be separately labeled (R-12, R-22, etc) and no mixing of refrigerants will be accepted. Prior to removal, contact the DPW Classification Unit to clarify the logistics to manage the halon tanks.

3.3.6 Chlordane in Soil

The Contractor shall salvage all excavated material and reuse it at the project site to minimize disposal requirement and worker exposure. It is unlikely that this issue is a concern for the project sites. The Contractor shall practice dust control at project site in accordance with specification Sections 01355 ENVIRONMENTAL PROTECTION and 01561 DUST CONTROL.

If soil is to be removed and disposed, Toxicity Characteristic Leaching Procedure for soil chlordane is required, unless analytical data are available from project site or similar projects. If TCLP chlordane is less than 0.03 mg/L, it is characterized as non-hazardous material in accordance with 40 CFR 261.

3.3.7 Transformers

The Contractor shall verify the locations of transformers as shown on the electrical utility layout or demolition plans and obtain data plates information from DPW for the transformers to be removed. The Contractor shall coordinate with DPW that has access to the analytical data base of the transformers and obtain data plates information of the transformers to be removed. Disconnection of electrical services shall be approved by the Directorate of Public Works and Logistics (DPWL) and the Contracting Officer.

The Contractor shall prepare government Form 1340 and list transformers identification numbers, types, sizes, and attach PCB test results from the data base. A copy of Form 1340 shall be submitted to DOE and the Contracting Officer to schedule for pre-inspection. The Contractor shall remove and transport the transformers to a staging area approved by the Contracting Officer. In accordance with 40 CFR 761.20, The Contractor shall provide containment at the staging area to prevent storm water pollution. The Contractor shall prepare manifests (EPA Form 8700-22) for

both PCB contaminated transformers (with PCB levels greater than 50 parts per millions (ppm) but less than 500 ppm) and PCB transformers (with PCB levels equal to or greater than 500 ppm). If the transformer is non-PCB but is a liquid transformer, it shall be classified as either TCB or DEHP. After approval of pre-inspection, the Contractor shall haul all transformers with Form 1340s to a designated location for final removal. The Contractor shall provide shipping description (which consists of RQ designation, shipping name, hazard class, UN identification number, packing group, and supplemental information) in accordance with 49 CFR 173.

3.3.8 Utility Poles

The Contractor shall verify locations and sizes of wood poles at demolition site. The Contractor shall coordinate with the Directorate of Public Work and Logistic (DPWL) and the Contracting Officer Representative to verify those used utility poles to be removed in this project. Utility poles shall be salvaged to the maximum extent possible by the Contractor. However, if they are disposed as waste material, the disposal facility receiving those wood poles shall have permit or written authorization by the Texas commission on Environmental Quality to receive wood poles which are typically contaminated with arsenic and/or creosote.

3.3.9 Heating and Chilling Water System

The Contractor shall purge and thoroughly rinse the system prior to dismantling. The contaminated water shall be contained and discharged at a permitted facility. The structure shall be recycled as scrap metal or reused by a non-profit organization.

3.3.10 Grease Trap

Typically, dining facility will have a grease trap unit. The Contractor shall have a state registered oil and grease sludge hauler purge and thoroughly rinse the system prior to dismantling and removal of the unit. The oil and grease sludge and the rinsed unit shall be recycled to the maximum extent, if possible.

3.4 RECYCLING/DESTRUCTION FACILITY

The Contractor shall use EPA permitted recycling/destruction facility in accordance with 40 CFR 261, 40 CFR 268, and 40 CFR 270 and/or State permitted or registered facility which holds current environmental pollution liability insurance coverage.

3.5 CLOSURE REPORT

The report shall contain: (1) A signed cover letter certifying completion of work described herein, (2) A signed Statement of Compliance, appended herein, (3) A brief narrative of worker protection and waste removal, segregation, packaging, transportation, and ultimate method of disposal (i.e. recycled/reuse, incinerated, landfill, etc.), (4) A description of accidents, ruptures, leaks, subsequent response procedures and cleanup, and (5) A copy of final disposition document of each item including at least the following: notification, signed manifest of waste, signed certificates or receipts (Bill of Lading) from each recycling or destruction facility.

3.6 STATEMENT OF COMPLIANCE

The Statement of compliance follows this page.

STATEMENT OF COMPLIANCE

I hereby certify that:

- (1) the appropriate state manifest form has been completely and properly filled out;
- (2) the packing, marking, labeling and placarding of the waste meets all applicable regulations;
- (3) the waste transportation, recycling, destruction and disposal meets all applicable Federal, State and local regulations.

Name_____

Title_____

Date_____

-- End of Section --

APPENDIX B

GEOTECHNICAL REPORT (PRELIMINARY)

1.1 Introduction. Geotechnical requirements for this project include but are not limited to the preparation of the Foundation and Pavement Design Analysis, foundation design and pavement designs, and all specifications, sections, details, and all pertinent foundation and pavement design drawings for the Design/Build 4ID Modularity project at Fort Hood, Texas. The Contractor shall submit with the proposal the names, addresses and qualifications of the geotechnical firms, drilling firms, and testing laboratories that are registered in the State of Texas intended for subcontracting for approval to the Corps of Engineers, Fort Worth District. Approval of the aforementioned firms or laboratories does not release the Contractor from responsibility for an approved Foundation and Pavement Design Analysis (FDA/PDA) nor should it be construed as approval of the FDA/PDA. In addition, approval of the aforementioned firms or laboratories does not release the Contractor from responsibility for the adequacy of geotechnical specifications, sections, details, and all pertinent foundation and pavement design drawings, and related geotechnical portions of the project.

1.2 Foundation and Pavements. The foundation and pavement designs, FDA/PDA, Geotechnical specifications, sections, details, and pertinent foundation and pavement design drawings, and related geotechnical portions of the project shall comply with, but not be limited to, the following referenced material and criteria.

- a. TM 5-822-7 Standard Practice for Concrete Pavements
(<http://www.usace.army.mil/inet/usace-docs/armytm/tm5-822-7/>)
- b. TM 5-822-8 Bituminous Pavements Standard Practice
(<http://www.usace.army.mil/inet/usace-docs/armytm/tm5-822-8/>)
- c. TM 5-822-5 Pavement Design for Roads, Streets, Walks, and Open Storage Areas (<http://www.usace.army.mil/inet/usace-docs/armytm/tm5-822-5/>)
- d. TM 5-822-2 General Provisions and Geometric Design for Roads, Streets, Walks, and Open Storage Areas (<http://www.usace.army.mil/inet/usace-docs/armytm/tm5-822-2/>)
- e. ETL1110-1-139 Engineering and Design – Selecting Asphalt Cements
(<http://www.usace.army.mil/inet/usace-docs/eng-tech-ltrs/etl1110-1-139/toc.html>)
- f. ETL 1110-3-393 Design of Surfaced Areas
(<http://www.usace.army.mil/inet/usace-docs/eng-tech-ltrs/etl1110-3-393/toc.html>)
- g. SWDR 1110-34-1 Testing of Aggregates and Designing Mixtures for Asphaltic Concrete and Portland Cement Concrete Pavements

- h. EM 1110-2-1906, Engineering and Design, Laboratory Soils Testing
(<http://www.usace.army.mil/inet/usace-docs/eng-manuals/em1110-2-1906/toc.htm>)
- i. TM 5-818-1, Soils and Geology Procedures for Foundation and Design of Buildings and Other Structures (Except Hydraulic Structures)
(<http://www.usace.army.mil/inet/usace-docs/armytm/tm5-818-1/>)
- j. TI 809-04 Seismic Design for Buildings
(<http://www.hnd.usace.army.mil/techinfo/ti/809-04/ti80904.htm>)
- k. TM 5-809-12 Concrete Floor Slabs on Grade Subjected to Heavy Loads
(<http://www.usace.army.mil/inet/usace-docs/armytm/tm5-809-12/>)
- l. Index of Guide Specifications for Military Construction
(<http://www.ccb.org/ufigs/ufigs.htm>)
- m. Foundation and Pavement Design Analysis Format Example (Attachment 1A)
- n. EM 1110-1-1804 Engineering and Design, Geotechnical Investigations
- o. Southwestern Division AEIM (October 2000)
(<http://www.swf.usace.army.mil/pubdata/ec/eca/2000aeim.asp>)

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- p. AR 210-20, Master Planning for Army Installations**
(http://www.usapa.army.mil/pdffiles/r210_20.pdf)
- q. TM 5-822-14/AFJMAN 32-1019, Soil Stabilization for Pavements**
(<http://www.usace.army.mil/inet/usace-docs/armytm/tm5-822-14/>)
- r. UFC 3-250-03 Standard Practice Manual for Flexible Pavements**
(<http://www.hnd.usace.army.mil/techinfo/UFC/UFC3-250-03hi.pdf>)
- s. UFC 3-260-01, Airfield and Heliport Planning and Design**
(<http://www.hnd.usace.army.mil/techinfo/UFC/UFC%203-260-01.pdf>)
- t. UFC 3-260-02, Pavement Design for Airfields**
(<http://www.hnd.usace.army.mil/techinfo/UFC/ufc326002H/ufc3-260-2.pdf>)
- u. UFC 3-260-03, Pavement Evaluation**
([http://www.hnd.usace.army.mil/techinfo/UFC/UFC326003/UFC%203-260-03\(high\).pdf](http://www.hnd.usace.army.mil/techinfo/UFC/UFC326003/UFC%203-260-03(high).pdf))

1.3 Subsurface Exploration. The Government has not conducted a site-specific geotechnical field investigation for this project. However, prior to final design of the foundation and pavement features for the project, a site-specific geotechnical field investigation and laboratory testing program must be conducted for each of the 4ID Modularity sites. Therefore the Contractor shall submit his proposed exploration plan to the Contracting Officer for approval. It is the Contractor's responsibility to review, interpret, and evaluate the subsurface investigation and laboratory test data. The Contractor will be required to drill and sample the proposed borings in accordance Corps of Engineers (COE) criteria listed in EM 1110-1-1804 (AM#0002) using a licensed geotechnical firm. All soil samples collected during the subsurface investigation shall be tested at a Corps of Engineers approved laboratory. (AM#0002) For the Echo Apron extension at Hood Airfield, the Contractor shall drill a minimum of six (6) borings, evenly distributed within the area of proposed apron extension; the borings will be drilled to a minimum depth of 10 feet. Representative soil samples shall be collected within the apron extension borings and subjected to laboratory testing to include Atterberg limits and laboratory CBR testing. Laboratory tests shall be performed in accordance with "Laboratory Soils Testing" (EM 1110-2-1906). Geotechnical designs shall be based on soil data and technical criteria provided, and shall be in accordance with the Foundation and Pavement Design Analysis Format Example. The Contractor is responsible for all applicable clearances and permits from Fort Hood, and for the protection of all underground utilities that could be damaged during the field investigation. The site shall be returned to its original state after such drilling.

1.4 General Geology. Fort Hood lies within the Central Texas Section of the Great Plains physiographic province. The topographic features of the area are those of a dissected plateau characterized by buttes and mesas. Approximately 30 miles southeast of Fort Hood, the dissected plateau topography gives way to the moderate or rolling relief of the Gulf Coastal Plain. The Balcones fault zone is, roughly, the dividing line of the two physiographic provinces. The uppermost primary stratum underlying Fort Hood is the Walnut Formation of the Comanche Series, Cretaceous age. The Walnut Formation is composed of gray-black, calcareous clay shales alternating with beds of chalky, nodular limestone and shell conglomerates.

Overburden soils within the area vary from a knife edge to greater than 30 feet in thickness, and consist of clays of low to high plasticity, clayey gravels and/or clay choked limestone nodules. The overburden soils are residual soils derived from the underlying parent material.

1.5 Borrow Areas. There are many potential borrow material sources within the confines of Fort Hood, as well as in nearby areas. The Contractor shall be responsible for locating, testing, and providing required data to the Government for approval of all proposed borrow sources. The borrow material must meet all specification requirements and shall not be used prior to approval.

1.6 Foundation Design Analysis. The foundation design requirements for this project are provided in the Structural Design section of the RFP. For any new (AM#0002) permanent

structure(s) larger than 500 GSF in size, a reinforced concrete straight-shaft drilled pier foundation system is required for bidding purposes. For any new **(AM#0002) permanent** structure(s) equal to or less than 500 GSF in size, a reinforced concrete slab-on-grade with turned-down edge beam foundation system is required for bidding purposes. **(AM#0002) A reinforced concrete slab-on-grade with turned-down edge beam foundation system is considered optional, but is not required, for non-permanent structures (e.g., temporary modular facilities). A flexible pavement section, such as that provided in Paragraph 1.7.2.a., below, for Access Roads and Service Drives, or an aggregate surface course pavement section may also be used as an all-weather surface on which to place temporary modular facilities that are supported on (e.g.) cinder block footings.** Site conditions may vary considerably (i.e., soil type, densities of materials, topographic relief, etc.); cut and fill requirements for site development are unknown; types, sizes and locations of structure(s) are not established (i.e., 2-story, single-story, single unit, multiple units, etc.), therefore, the two respective foundation systems are provided in order to address all building possibilities and provide a standard for bidding purposes. Foundation designs and recommendations for features such as retaining walls, perimeter walls, etc., are the Contractor's responsibility and will be included as part of the FDA. Additional drilling, sampling, and testing is required by the successful proposer. The successful proposer shall submit a drilling and testing plan to the Contracting Officer for approval prior to soil sampling and testing. Therefore, design of any foundation system to support any structure(s) is also required. The design of any foundation system shall include, but not be limited to, identification of foundation structural design method used, presentation of allowable bearing capacity, soil parameters, settlement or consolidation, other applicable soil properties (i.e., permeability, shear strength, etc.) and all associated calculations. A Foundation Design Report shall be prepared describing, evaluating, and presenting boring locations, boring logs, a plasticity chart, gradation curves, moisture content/liquid limit/plastic limit versus depth chart, moisture content/dry density versus depth chart, unconfined compression test results, and consolidation/swell test results, as applicable. The Foundation Design Report narrative and data presentation shall be submitted to the Contracting Officer for review and approval. The narrative and all data shall be prepared and presented in the format shown in the Government-furnished Foundation and Pavement Design Analysis Format Example (Attachment 1A). Analysis for design shall be prepared separately from the design narrative and data presentation. Any unusual features shall also be addressed such as above ground and/or underground structures (i.e., pits, manholes, retaining walls, etc.) and associated soil parameters. The Foundation Design Report shall also discuss deformation sensitive areas of ceramic tile, quarry tile, or similar floor materials, and the foundation design requirements for those areas. **(AM#0002) If the foundation system selected and its associated structural design requirements are approved by the Contracting Officer, and are different than the two systems stated in this document, as provided for in this RFP, then a modification to this contract will be required.** The following (minimum) foundation requirements are based on criteria contained in *TM 5-818-1/AFM 88-3, Chapter 7, TM 5-818-7*, and engineering judgment.

a. Foundation System. Any new **(AM#0002) permanent** buildings larger than 500 GSF in size should be supported on reinforced concrete straight-shaft drilled piers. The piers should bear within the weathered yellow brown light gray and white limestone encountered. For bidding purposes, an average bearing depth of 20 feet below existing grade

should be assumed. Allowable (net) end bearing capacities for new buildings should be determined through a site-specific geotechnical field investigation and laboratory testing program, conducted by the Contractor. For bidding purposes, an estimated minimum allowable end bearing capacity of 15.0 ksf (net) should not be exceeded when sizing the pier shafts. The bearing allowable can be increased for wind load considerations. Additionally, straight-shaft drilled piers can be sized for an allowable side shear value of 1.0 ksf (net) (per foot) for that portion of the pier shaft embedded within the limestone primary. For this design condition, the effective length (L_{eff}) starts 5 feet below existing grade and extends to within one shaft diameter of the final bearing depth. Individual piers can be extended if additional load-carrying capacity in side shear is required. Based on structural requirements, the load used to size the piers should consist of full dead load plus that portion of the live load that acts more or less continuously, usually 50 percent. ***If the piers are designed for both end bearing and skin friction, the foundation notes need to reflect this condition.***

All pier shafts should be a minimum of 18 inches in diameter to facilitate clean out and inspection of the pier holes during construction. A minimum of 1.5 percent reinforcing steel should be placed in each pier shaft, based on the cross-sectional area of the pier. A clear distance of at least two shaft diameters should be maintained between individual piers. The larger size should be used for this condition when shaft sizes differ. A minimum 6-inch void should be maintained beneath all grade beams, and the void area should be protected with concrete retainer blocks as shown in the latest edition of the SWD-AEIM. ***The bottom of all grade beams shall be formed with plywood to provide the 6-inch void.***

The contractor shall have temporary steel casing and pumps at the job site prior to construction of drilled piers. Based on historical data at Fort Hood, groundwater should be anticipated during drilling operations; therefore, the above information should be provided in the contract documents as foundation notes. ***For cost estimation purposes, it should be assumed that approximately 50 percent of each pier shaft at each site will have to be cased. Final pier depths shall be determined in the field by the Contracting Officer's representative.***

Drilling equipment should be of suitable type and of sufficient size to satisfactorily perform the required drilling for the soil conditions identified. To this end, all drill rigs shall have a 6-inch Kelly bar and be capable of producing minimum torque and crowd capacities of 50,000 lb-ft and 30,000 lb-ft, respectively.

It should be noted that, depending on the site conditions, the demolition of existing structure(s) that likely utilized deep foundation systems may be required. A determination of the locations of the foundations of these buildings (e.g., pier locations) must be made to avoid possible conflict with the piers associated with the current project.

b. **(AM#0002) Permanent Small Support-type Structures. (AM#0002)** **Permanent** Small support-type structures (≤ 500 GSF), if applicable, can be supported on a reinforced concrete slab-on-grade with turned-down edge beam foundation. The turned-down edge beam should extend a minimum of 12 inches below outside finished grade, and can be sized for a safe bearing pressure of 2,000 psf (net). Subgrade preparation should consist of

providing a minimum of 24 inches of compacted nonexpansive fill below the soil-supported slab.

(AM#0002) c. Temporary Modular Structures. A reinforced concrete slab-on-grade with turned-down edge beam foundation system is considered optional, but is not required, for non-permanent structures (e.g., temporary modular facilities). A flexible pavement section, such as that provided in Paragraph 1.7.2.a., below, for Access Roads and Service Drives, or an aggregate surface course pavement section may also be used as an all-weather surface on which to place temporary modular facilities that are supported on (e.g.) cinder block footings.

1.6.1 Subgrade Preparation.

a. Structurally-Supported. Ground-level floor slabs should be structurally-supported where practicable. The structurally-supported floor slabs should be supported above a minimum 6-inch void. Floor slabs within deformation sensitive areas that incorporate ceramic tile flooring (e.g., rest rooms) should be structurally-supported if 1.5 inches of long-term differential movement is unacceptable. Historically, this amount of movement has caused ceramic floor tile to crack. Stoops, porches, approaches, etc. should also be structurally-supported to compensate for the active subgrade. If the design requires the incorporation of a crawl space beneath the buildings, the underfloor area should be sloped to collection points and drained using sumps and pumps.

b. Slab-On-Grade. Due to the active subgrade, slab-on-grade construction **(AM#0002) for permanent structures** should be considered only for storage and/or mechanical rooms, or areas within facilities that will experience forklift or other vehicular loadings (if applicable). Where floor slabs must be placed on-grade, proper subgrade preparation must be provided to limit long-term differential floor slab movements to 1.5 inches or less. Floor slabs must be structurally supported in areas where 1.5 inches of differential settlement cannot be tolerated. Soil-supported floor slabs should be isolated from any portion of the building structure and foundation using ½-inch expansion joints. Transitional areas, such as door openings, should be articulated to prevent offsets from occurring. A polyethylene vapor barrier and a minimum 6-inch capillary water barrier should be provided beneath floor slabs supported on-grade.

1.6.2 Subgrade Preparation and Fill Requirements.

a. Structurally-Supported Floor Slabs. Subgrade preparation should consist of removing the upper 12 inches of existing materials and replacing with a compacted select backfill. Any additional fill required to raise the subgrade to the final elevation(s) below the building floor slab system should be select material as well. Select fill should be placed in controlled lifts not exceeding 8 inches in loose thickness and compacted to at least 90 percent of laboratory maximum density as determined in accordance with ASTM D 1557. If all or a portion of the building pad will be a cut section, subgrade preparation should consist of removing all existing materials to a depth that allows a minimum 6-inch void to be formed

below the floor slab system. The upper 6 inches of existing subgrade exposed after cut and/or fill operations should be scarified, moistened, and recompact to the same density required for select fill.

b. Slab-On-Grade. Subgrade preparation to allow for slab-on-grade construction **(AM#0002) for permanent structures** should consist of removing the upper 4 feet of existing material or to top of limestone, whichever occurs first, and replacing with compacted nonexpansive backfill material. Any additional fill required to achieve the final subgrade elevation below the building floor slab should be nonexpansive as well. The upper 6 inches of existing subgrade exposed after earthwork operations should be scarified, moistened, and recompact to the same density required for nonexpansive fill. Nonexpansive fill should be placed in controlled lifts not exceeding 8 inches in loose thickness and compacted to at least 92 percent of laboratory maximum density as determined in accordance with ASTM D 1557. If all or a portion of the building pad will be a cut section, subgrade preparation should consist of removing all existing materials to a depth that allows for a minimum of 4 feet of compacted nonexpansive fill to be placed below the floor slab system. The upper 6 inches of existing subgrade exposed after cut and/or fill operations should be scarified, moistened, and recompact to the same density required for nonexpansive fill.

1.6.3 Moisture Control. All surface water flowing into the building sites should be diverted around the structures so it will not infiltrate the subgrade. Rainfall should be prevented from entering the subgrade around the perimeters of the structures, by providing paving, drainage slopes, and diverting gutter downspouts away from the foundations, or combination thereof. When surface or subsurface water cannot be diverted away from the buildings, an interceptor or perimeter drains should be used and designed to prevent the drains from introducing water to the foundations.

1.6.4 Below-Grade Structures. The following information is provided for the design of all below-grade structures, if applicable. An at-rest lateral earth pressure coefficient (k_0) of 0.7, an angle of internal friction (ϕ) of 28° , a cohesion value (c) of 100 psf, and an allowable bearing capacity of 2,000 psf should be used. The backfill material should be assumed to have a moist unit weight of 125 lb/ft^3 and all backfill should be nonexpansive or select material.

1.6.5 Foundation Material Definitions.

a. Satisfactory Materials. Satisfactory Materials include materials classified in ASTM D 2487 as GW, GM, GC, GP, SW, SM, SP, SC, CL, and CH and shall be free of trash, debris, roots, or other organic matter, or stones larger than 3 inches in any dimension.

b. Unsatisfactory Materials. Unsatisfactory Materials include materials classified in ASTM D 2487 as Pt, OH, OL, ML, MH and any other materials not defined as satisfactory. Man-made fills are considered unsatisfactory materials.

c. Nonexpansive Soils. Nonexpansive Soils shall meet the requirements of Texas Department of Transportation Standard Specification for Base Course, Item 247, Type A, Grade 1 or 2.

d. Select Soils. Select soils are satisfactory material having a liquid limit of 35 percent or less and a plasticity index not less than 4 nor greater than 18 when tested in accordance with ASTM D 4318.

e. Cohesionless and Cohesive Materials. Cohesionless Materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive Materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.

f. Capillary Water Barrier. Capillary Water Barrier shall consist of clean, crushed, nonporous rock, crushed gravel, or uncrushed gravel. The maximum particle size shall be 1.5 inches and no more than 2 percent by weight shall pass the No. 4 (3/16-inch) size sieve.

1.6.6 Foundation Material Testing Requirements. In-place densities of the subgrade, fills, and backfills shall be performed for every 2,500 feet per lift in accordance with ASTM D 1556 or ASTM D 2922. Optimum Moisture and Laboratory Maximum Density of nonexpansive fill and backfill shall be performed for every 500 cubic yards or when any change in material occurs.

1.7 Pavement Design Analysis. Presented below are minimum pavement sections that are required for bidding purposes, if applicable. The pavement structures were derived using pavement data reports from previous projects at Fort Hood and the installations general satisfaction with the performance of these pavements. If it is determined after award of the RFP that these pavement structures are not adequate based on the soil conditions identified, **(AM#0002) the pavement sections shall be strengthened, as necessary, and a revised Pavement Design Report shall be submitted to the Government** ~~the successful proposer shall submit a Pavement Design Report.~~ The narrative and all data shall be prepared and presented in the format shown in the Government-furnished Foundation and Pavement Design Analysis. The FDA/PDA shall include but not be limited to, presentation and discussion of general project conditions, subsurface investigations and laboratory test data, subsurface conditions, design requirements, material definitions, and flexible and rigid pavement designs (including, but not limited to, pavement structure materials; construction thicknesses and compactive effort requirements in accordance with ASTM D 1557; CBR values for 90 percent, 95 percent, and 100 percent compaction; traffic classifications and categories; types and weights of vehicles; vehicle frequency of use; concrete flexural strength for designated time frame; and modulus of subgrade reaction utilized for design). The pavement materials description will address, as applicable, but not be limited to, requirements for hot-mix, prime coat, tack coat, aggregate base course, lime-modified subgrade, Portland cement concrete, reinforcing steel, and subgrade preparation. Calculations shall address each type of pavement element affected by the additional pavement requirements. The designs of the minimum pavement sections presented below are based on criteria contained in *TM 5-822-2/AFM 88-7*,

Chapter 5, TM 5-822-5/AFM 88-7, Chapter 1, TM 5-809-12/AFM 88-3, Chapter 15, and engineering judgment.

1.7.1 Rigid Pavement. The minimum pavement sections presented below are recommended for vehicle hardstands, aprons at vehicle bays, aprons in front of trash dumpster pads, and building floor slabs within vehicle maintenance bays. The exact nature of expected vehicular traffic was not known at the time of this report. The design of the rigid pavement sections provided herein is based on the assumption that the maximum vehicular traffic and frequency will be Category IVA Traffic on a Class E Street (resulting in a Design Index (DI) of 5), unless stated otherwise. **(AM#0002) A pavement section is also included for the Concrete Apron for the proposed Echo Apron Extension at Hood Army Airfield.** The rigid pavement designs consider a modulus of subgrade reaction of 100 pci and a concrete flexural strength of 650 psi at 28 days.

a. Vehicle Hardstands. The design is based on Category IVA Traffic and a Class E Street (use a Design Index (DI) = 5).

8" Portland Cement Concrete (nonreinforced)

6" Aggregate Base Course compacted to at least 95 percent of maximum laboratory density (ASTM D 1557)

6" Raw Subgrade compacted to at least 90 percent of maximum laboratory density (ASTM D 1557)

◆ Optional Reinforced Concrete Section.

6.5" Portland Cement Concrete reinforced with No. 4 bars spaced 16 inches o.c.e.w.

6" Aggregate Base Course compacted to at least 95 percent of maximum laboratory density (ASTM D 1557)

6" Raw Subgrade compacted to at least 90 percent of maximum laboratory density (ASTM D 1557)

b. Aprons at Vehicle Bays (If Applicable). The design is based on Category IVA Traffic and a Class E Street (DI = 5).

6.5" Portland Cement Concrete reinforced with No. 4 bars spaced 16 inches o.c.e.w.

6" Aggregate Base Course compacted to at least 95 percent of maximum laboratory density (ASTM D 1557)

6" Raw Subgrade compacted to at least 90 percent of maximum laboratory density (ASTM D 1557)

c. Aprons in front of Trash Dumpster Pad(s). The following pavement section is recommended for a minimum distance of 15 feet in front of trash dumpster pad(s). The design is based on Category IVA Traffic and a Class F Street (DI = 4).

6" Portland Cement Concrete reinforced with No. 4 bars spaced 16 inches o.c.e.w.

6" Aggregate Base Course compacted to at least 95 percent of maximum laboratory density (ASTM D 1557)

6" Raw Subgrade compacted to at least 90 percent of maximum laboratory density (ASTM D 1557)

Reinforcement for odd-shaped slabs, joint design, joint spacing, and other details should be in accordance with the latest edition of the SWD-AEIM and TM 5-822-5, where applicable. The reinforcement bars should be placed a minimum of 1.5 inches clear distance from the surface of the pavement.

d. Floor Slabs within Vehicle Bays (If Applicable). The following pavement section is based on a 50-kip axle load vehicle making 10,000 passes over 20 years, an effective modulus of subgrade reaction equal to 200 pci (upgraded due to nonexpansive fill), and a concrete flexural strength of 650 psi at 28 days. The vehicular floor slab should have a minimum thickness of 6 inches and should be reinforced with No. 4 bars spaced 12 inches on-center and in each direction. The design of the vehicular floor slab supported on-grade is based upon vehicle-imposed loads only, without regard for stresses caused by stationary live loads and/or other loading conditions. Subgrade preparation below floor slabs supported on-grade should consist of removing a minimum of 4.0 feet of existing materials and replacing with compacted nonexpansive backfill material. Any additional fill required to reach the final subgrade elevation below the building floor slab should be nonexpansive material as well. The upper 6 inches of existing subgrade exposed after excavation operations should be scarified, moistened, aerated, and recompact to the same density as required for nonexpansive fill. Nonexpansive fill should be placed in controlled lifts not exceeding 8 inches in loose thickness and compacted to at least 92 percent of laboratory maximum density as determined in accordance with ASTM D 1557.

(AM#0002) e. Concrete Apron for Echo Apron Extension. The design is based on information regarding the existing apron presented within ERDC/GSL SR-00-1, Subject: "Airfield Pavement Evaluation, Hood Army Airfield, Fort Hood, Texas", dated November 2000, and discussions with the airfield manager regarding the current condition of the existing apron pavement and anticipated vehicle traffic on the proposed extension. Based on this information, it is anticipated that the new apron pavement may receive approximately 40 daily passes by a UH-60 (Blackhawk) and approximately 30 daily passes

by a M978 (HEMTT) 2500-gallon fuel tanker vehicle. The design considers a modulus of subgrade reaction of 100 pci and a concrete flexural strength of 650 psi at 28 days.

6" Portland Cement Concrete (nonreinforced)

6" Aggregate Base Course compacted to at least 95 percent of maximum laboratory density (ASTM D 1557)

6" Raw Subgrade compacted to at least 90 percent of maximum laboratory density (ASTM D 1557)

Although the UH-60 and M978 are the only two types of vehicles currently anticipated to utilize the apron extension, the airfield management stated the potential that CH-47 (Chinook) rotary aircraft could operate on the apron in the future on a limited scale. The Contractor shall verify this information with the airfield management prior to the pavement design for the apron extension, and strengthen the pavement section, as necessary. For example, for a CH-47 vehicle making 10 daily passes, the thickness of the apron shall be increased by 1 inch (minimum). It should be noted that the minimum airfield designs for the Echo Apron Extension presented herein were developed utilizing PCASE software. The Contractor is required to develop final airfield pavement designs utilizing PCASE software.

1.7.2 Stabilized Base Course ("Black Base" Surface Course) Pavement. The pavement sections presented below are recommended for access drives and service roads, and for privately-owned vehicle (POV) parking areas. As previously stated, the exact nature of expected vehicular traffic on the access drives and service roads was not known at the time of this report. The design of the stabilized base course pavement sections provided herein is based on the assumption that the maximum vehicular traffic and frequency will be Category IVA Traffic on a Class E Street (resulting in a Design Index (DI) of 5), unless stated otherwise. **(AM#0002) A pavement section is also included for Shoulders for the proposed Echo Apron Extension at Hood Army Airfield.** The stabilized base course pavement designs consider a CBR value of 4 for the raw subgrade when compacted to 90 percent of maximum laboratory density.

a. Access Drives and Service Roads. The design is based on Category IVA Traffic and a Class E Street (DI = 5).

2.5" Hot-Mix Surface Course

8" Asphalt-Stabilized Aggregate Base Course compacted to at least 100 percent of maximum laboratory density (ASTM D 1557)

6" Aggregate Base Course compacted to at least 100 percent of maximum laboratory density (ASTM D 1557)

6" Subbase Course compacted to at least 95 percent of maximum laboratory density (ASTM D 1557)

6" Raw Subgrade compacted to at least 90 percent of maximum laboratory density (ASTM D 1557)

b. POV Parking Areas. The design is based on Category II Traffic and a Class E Street (DI = 2).

1.5" Hot-Mix Surface Course

8" Asphalt-Stabilized Aggregate Base Course compacted to at least 100 percent of maximum laboratory density (ASTM D 1557)

6" Aggregate Base Course compacted to at least 95 percent of maximum laboratory density (ASTM D 1557)

6" Raw Subgrade compacted to at least 90 percent of maximum laboratory density (ASTM D 1557)

(AM#0002) c. Shoulders for Echo Apron Extension. The design is based on the information described in Paragraph 1.7.1.e., anticipated vehicular traffic consisting of a UH-60 making up to 10 daily passes and a M978 (HEMTT) fuel tanker vehicle making approximately 30 daily passes, and considers a CBR value of 4 for the raw subgrade when compacted to 90 percent of maximum laboratory density.

2" Hot-Mix Surface Course

6" Aggregate Base Course compacted to at least 100 percent of maximum laboratory density (ASTM D 1557)

6" Aggregate Base Course compacted to at least 100 percent of maximum laboratory density (ASTM D 1557)

6" Raw Subgrade compacted to at least 90 percent of maximum laboratory density (ASTM D 1557)

It should be noted that the minimum airfield designs for the Echo Apron Extension presented herein were developed utilizing PCASE software. The Contractor is required to develop final airfield pavement designs utilizing PCASE software.

The following notes should be incorporated as part of the pavement details shown on the contract drawings.

1. **"The moisture content shall be at least 1 percent above optimum during compaction of the raw subgrade."**
2. **"The subbase course in all of the paving sections can be replaced with aggregate base course using the same thickness and compaction requirements."**

1.7.3 Pavement Material Definitions.

a. Hot-Mix Surface Course. Aggregates and asphaltic materials shall conform to the requirements of the Texas Department of Transportation, Standard Specifications for Construction of Highways, Streets and Bridges, (TXDOT, Std Spec), Items 300 and 340. The paving mixture shall conform to the requirements for Type "D" (fine-graded surface course) grading. Asphaltic material for the paving mixture should be asphaltic cement, viscosity grade AC-20, or performance grade PG64-22. Guide Specification **CEGS-02741A HOT-MIX ASPHALT (HMA) FOR ROADS** has been edited to present the above requirements.

b. Prime Coat and Tack Coat. Asphaltic material for the prime coat shall be cut-back asphalt, grade MC-30, conforming to the requirements of TXDOT, Std Spec, Item 300, "Asphalts, Oils, Emulsions". Prime coat should be applied to the surface of the aggregate base course. Asphaltic material for the tack coat shall be cut-back asphalt, grade RC-250, or emulsified asphalt, grade SS-1, conforming to the requirements of TXDOT, Std Spec, Item 300, "Asphalts, Oils, Emulsions." Tack coat should be applied to all surfaces that contact new asphalt pavement. Guide Specification **CEGS-02748 BITUMINOUS TACK AND PRIME COATS** has been edited to present the above requirements.

c. Bituminous-Stabilized Base Course. The material shall conform to the requirements of **CEGS-02713A BITUMINOUS BASE COURSE**. Asphaltic material to use for the soil-bitumen mixture shall be a medium-curing (MC-70) cutback asphalt conforming to the requirements of TXDOT, Std Spec, Item 300, "Asphalts, Oils, Emulsions."

d. Aggregate Base Course. Aggregates shall conform to the requirements of **CEGS-02722 AGGREGATE AND/OR GRADED-CRUSHED AGGREGATE BASE COURSE**. The gradation should conform to the requirements of TXDOT, Std Spec, Item 247, for Type "A", Grade 1 material.

e. Subbase Course. The material shall meet the requirements of **CEGS-02721 SUBBASE COURSES** and shall have a CBR value of 20 percent.

f. Raw Subgrade. The material shall conform to the requirements of **CEGS-02300 EARTHWORK**. Prior to construction of the flexible and rigid pavements, a minimum of 6 inches of existing material should be removed from all pavement areas. After stripping, care should be taken not to disturb the remaining subgrade materials. Any fill material required to

bring the pavement structures to the required elevations should be a satisfactory material. Cohesionless fill material should be compacted to not less than 95 percent of laboratory maximum density and cohesive fill material should be compacted to not less than 90 percent of laboratory maximum density, as determined in accordance with ASTM D 1557.

g. Portland Cement Concrete. The material shall conform to the requirements of ***CEGS-02754A CONCRETE PAVEMENTS FOR SMALL PROJECTS***. The maximum nominal size coarse aggregate shall be 1.5 inches and the mixture shall be designed to attain a flexural strength of 650 psi at 28 days.

1.7.4 Pavement Material Testing Requirements. Testing shall be the responsibility of the contractor to ensure that the subgrade, aggregate base course, subbase course, lime-stabilized subgrade, hot-mix surface course, and Portland cement concrete are properly constructed. The following testing requirements shall be included in the contract specifications as a minimum:

a. In-place density testing of the subgrade, aggregate base course, and subbase course shall be performed, at a minimum, every 600 square yards per lift in accordance with ASTM D 1556 and ASTM D 2922. ASTM D 1556 shall be used as a check at least once per lift for each 3,000 square yards of completed subgrade, aggregate base course, and subbase course.

b. Before starting work, at least one sample of aggregate base course material shall be tested in accordance with ASTM C 136. After the initial test, a minimum of one sieve analysis (ASTM C 136 and ASTM D 422) shall be performed for each 1,000 tons of aggregate base course placed, with a minimum of one analysis performed for each day's run until the course is completed. One liquid limit and plasticity index shall be performed for each sieve analysis per ASTM D 4318.

c. Wear tests shall be performed in accordance with ASTM C 131. A minimum of one test per aggregate base course material source shall be run.

d. Thickness of the aggregate base course and subbase course shall be measured for each 600 square yards of material placed. Compacted thickness of the aggregate base and subbase course shall be as presented in this report and the completed section shall be within 3/8-inch of the thickness presented.

e. Hot Bin gradations for the asphalt wearing course shall be tested in accordance with ASTM C 136 and ASTM C 117. A minimum of one test shall be conducted. Marshall specimens shall be taken in accordance with methods described in AI MS-2. At least two sets of specimens shall be taken. Asphalt extractions shall be performed in accordance with ASTM D 2172, Method A or B. At least one asphalt extraction shall be conducted. Field density tests shall be conducted in accordance with ASTM D 2950. One test shall be conducted for each 300 square yards of pavement placed. The mat density shall be 97.5 to 100.5 percent and the joint density shall be 95.5 to 100.5 percent of the density obtained from laboratory-compacted specimens. Thickness measurements shall be taken at a minimum of one

measurement for each 1,000 square yards of pavement placed.

f. The Job Mix Formula for the bituminous mixture shall be furnished to the Contraction Officer for approval. The formula will indicate the percentage of each stockpile and mineral filler, the percentage of each size aggregate, the percentage of bitumen, and the temperature of the completed mixture when discharged from the mixer. The Contractor shall file with the Contracting Officer certified delivery tickets for all aggregates and bituminous materials actually used in construction. The finished mixture shall be designed using procedures contained in AI MS-2 and the criteria shown below.

<u>Test Property</u>	<u>50 Blows</u>
Stability (minimum), lbs	500
Flow (maximum), 1/100-inch	8-18
Air Voids, percent	3% to 5%
Percent Voids in mineral aggregate	14
TSR, minimum percent	75

g. The contractor shall be responsible for the development of the mixture proportion study for cementitious materials and chemical admixtures. The concrete mix design shall include a statement giving the maximum nominal coarse aggregate size and the proportions of all ingredients that will be used in the manufacture of concrete at least 60 days prior to commencing concrete operations. Trial design batches, mixture proportioning studies, and testing requirements shall be the responsibility of the Contractor. Strength requirements shall be based on flexural strength. Trial mixtures having proportions, slumps, and air content suitable for the work shall be based on methodology described in ACI 211.1, modified as necessary to accommodate flexural strength. The maximum water-cementitious material ratio is 0.45. Coarse and fine aggregates shall have a satisfactory service record of at least 5 years successful service in three paving projects, or if a new source is used, shall meet the requirements when tested for resistance to freezing and thawing. Coarse and fine aggregates not having a satisfactory demonstrable service record shall have a durability factor of 50 when subjected to freezing and thawing in concrete in accordance with COE CRD-C 114 (Test Method for Soundness of Aggregates by Freezing and Thawing of Concrete Specimens).

h. Smoothness measurements shall be taken in successive positions parallel to the pavement (flexible and rigid) centerline with a 12-foot straightedge. Measurements shall be taken perpendicular to the pavement (flexible and rigid) centerline at 15-foot intervals. Surface smoothness shall not exceed 3/8-inch.

ATTACHMENT 1A

FOUNDATION AND PAVEMENT DESIGN ANALYSIS FORMAT EXAMPLE

ATTACHMENT 1A
FOUNDATION AND PAVEMENT DESIGN ANALYSIS FORMAT EXAMPLE

1. **General.** The successful proposer shall provide a Foundation and Pavement Design Analysis after contract award. The Foundation and Pavement Design Analysis (Report) shall include a description of the project, including a discussion of any unusual features of the project, a discussion for each structure that requires a foundation system (i.e., houses, retaining walls, etc.), and a discussion of each pavement type. The discussions should also include a project location description and site topographic features.

2. **Subsurface Investigations.** Provide a complete description of the subsurface exploration program, including descriptions of types of borings and samplers (for both disturbed and undisturbed samples, as applicable) utilized, number of each type of boring, dates of exploration, and the name of the soils testing laboratory to be used. Provide plans showing boring logs and locations.

3. **Site Geology.** Provide a complete general geologic description of the area and a more specific description of the geology for Fort Hood, Texas.

4. **Subsurface Conditions.** A discussion of subsurface conditions, as interpreted from the field boring logs and laboratory test results, shall be included in this paragraph. Discuss the depth to groundwater/water table and possible effects of the groundwater on the design of the foundations and pavements.

5. **Seismic Design.** The seismicity of the area and the seismic zone in which the project will be built shall be discussed. The seismic design of the foundation system(s) shall be in accordance with criteria contained in TI-809-04.

6. **Testing.**

a. **Field Testing.** Provide a discussion addressing the field testing program to include identification of the borings tested, intervals and total depth of testing, and testing method(s). Reference applicable enclosures.

b. **Laboratory Testing.** Provide a discussion addressing all laboratory tests performed on samples collected during the field investigation to include identification of the borings tested. Where applicable, discuss specific results of laboratory testing that are considered applicable to the foundation and pavement design recommendations. Provide an evaluation of sample adequacy, as applicable. Reference applicable enclosures.

7. **Discussion.** An in-depth discussion of all foundation systems and pavement structures considered applicable for the project shall be included in this paragraph. The paragraph shall include a description of the foundation system(s) and pavement structures considered with a discussion of the advantages and disadvantages of each. For foundations, address finish floor elevations, cut and fill requirements, structural loads, and the structure(s) dimensions/geometry

for each type of structure and foundation system considered. For pavements, address types of vehicles and frequencies of use, corresponding design indexes, and pavement design parameters.

8. Recommendations. The recommended foundation system(s), pavement sections, and respective subgrade preparation and material testing requirements shall be discussed in this paragraph. The recommendations should be based on results of the field investigation, laboratory testing, and engineering studies.

a. Recommended Foundation System(s). If more than one foundation system is recommended, separate subparagraphs shall be used to discuss each foundation system. The subparagraphs shall provide a detailed description of the foundation system as well as specific design and construction requirements. The location and type of structure supported by that foundation system should also be discussed. Foundation design parameters and considerations should be provided and shall include as a minimum the following items: allowable bearing pressure(s); bearing elevations for each recommended foundation system; a minimum depth the foundation system shall bear below outside finished grade; foundation spacing requirements; foundation structural design methodology to be used; shrink-swell potential of the active subgrade; the design loads used to size the foundation elements; special considerations for deformation sensitive areas such as restrooms or other areas (i.e., tiled areas); a modulus of subgrade reaction; soil unit weights; at-rest and active earth pressure coefficients; anticipated settlement/differential settlement; and applicability (of each of the aforementioned items) to the design.

b. Recommended Pavement Sections. Provide separate subparagraphs for each rigid and flexible pavement structure included in the project. Each pavement design shall include as a minimum the following items: traffic types, road classifications and design indexes; subgrade strength values (CBR and modulus of subgrade reaction values for the specified compactive effort); pavement material thicknesses and compaction requirements; and concrete flexural strength for designated time frame.

c. Subgrade Preparation. This paragraph shall include a discussion on all requirements for excavation of existing subgrade materials, removal of existing unsuitable materials, replacement of excavated materials with nonexpansive and satisfactory materials, and minimum thickness of nonexpansive fill beneath building foundations. Provide compaction requirements for the raw subgrade, fill, and backfill materials. Foundation and pavement material definitions shall be presented.

9. List of Exhibits to be Included in the Foundation Design Analysis (Report).

Exhibit 1	Site Plan with Boring Locations and Legend
Exhibit 2	Drill Logs
Exhibit 3	Plasticity Chart
Exhibit 4	Standard Penetration Tests versus Depth of Boring (if applicable)
Exhibit 5	Moisture Content versus Depth
Exhibit 6	Moisture Content-Liquid Limit-Plastic Limit versus Depth

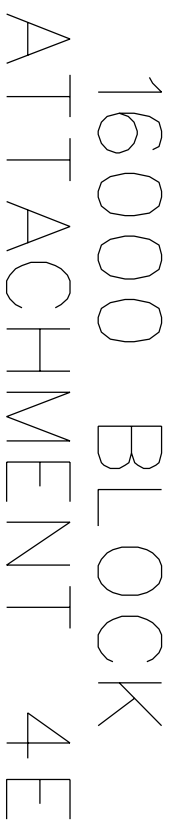
Exhibit 7	Unconfined Compression Test Results (if applicable)
Exhibit 8	Consolidation-Expansion Tests/Swell Pressure Tests (if applicable)
Exhibit 9	Tabulation of Laboratory Test Results (to include Boring Number, Sample Number, Depth, %Gravel, %Sand, %Fines, LL, PL, PI, WC, Unit Weight, Laboratory Classification, and Visual Descriptions)

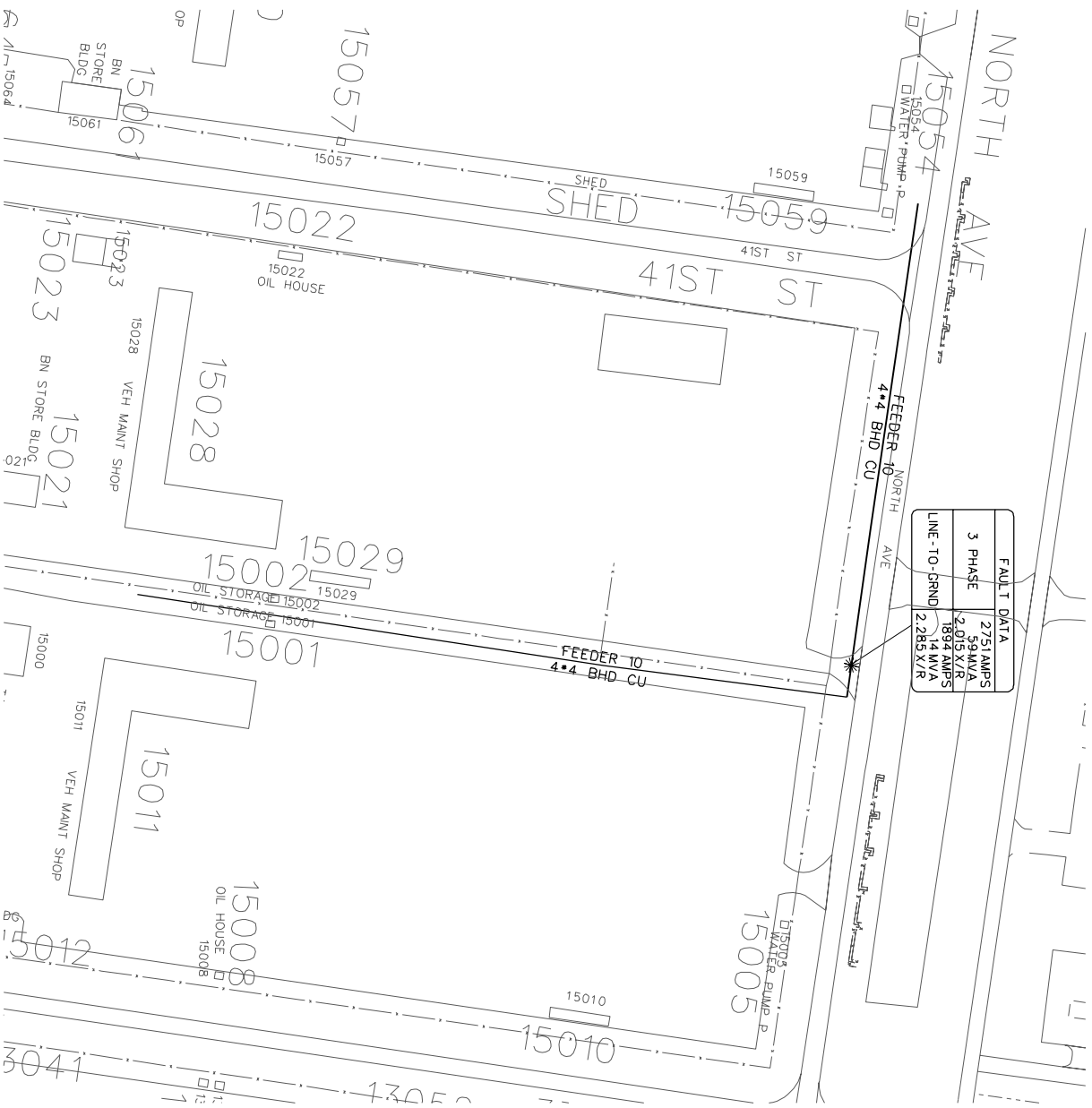
ATTACHMENT 1B
BORING LOGS AND LOCATIONS

ATTACHMENT 1C
LABORATORY TEST RESULTS

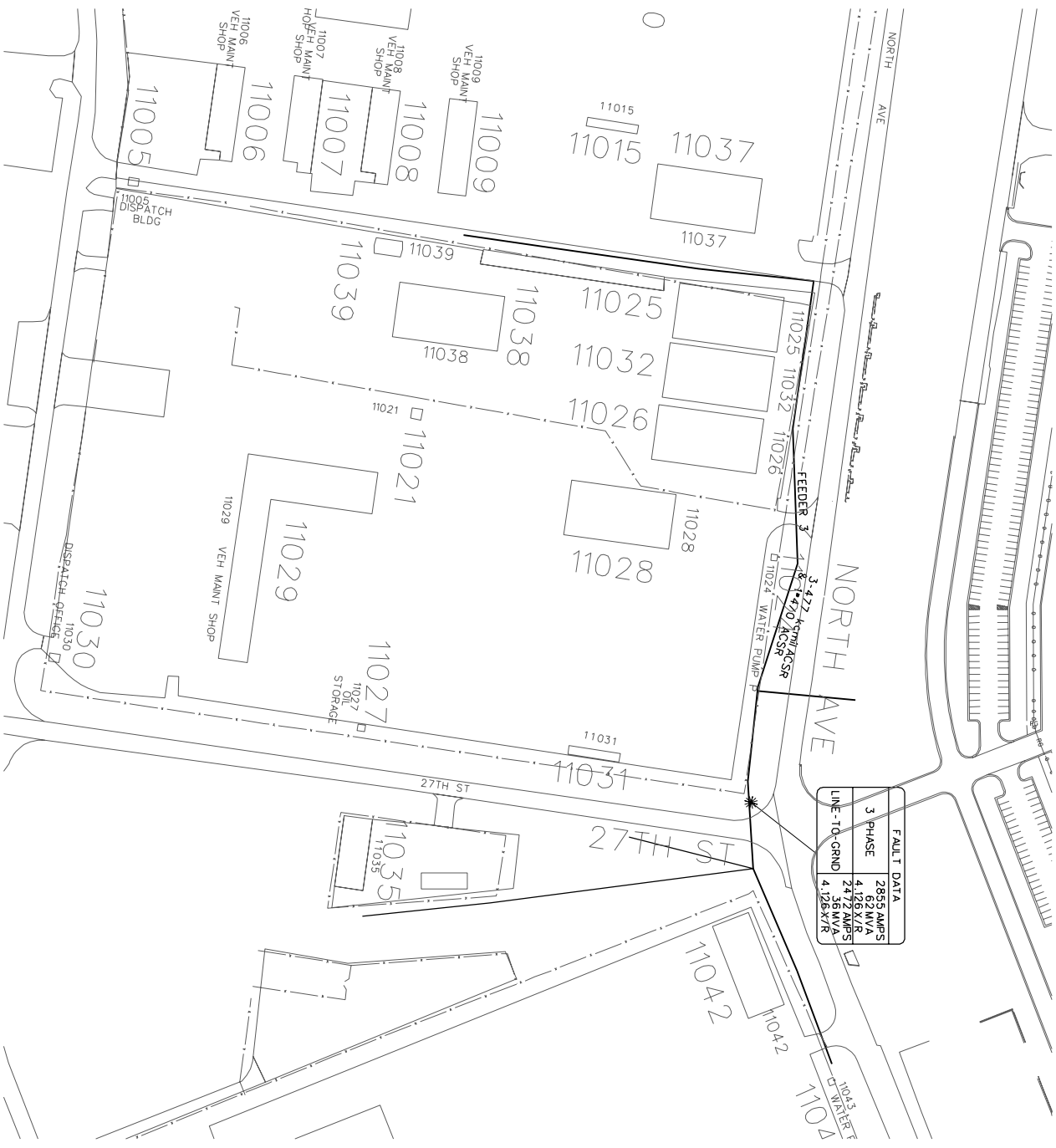
ATTACHMENT 1D

REFERENCE DATA





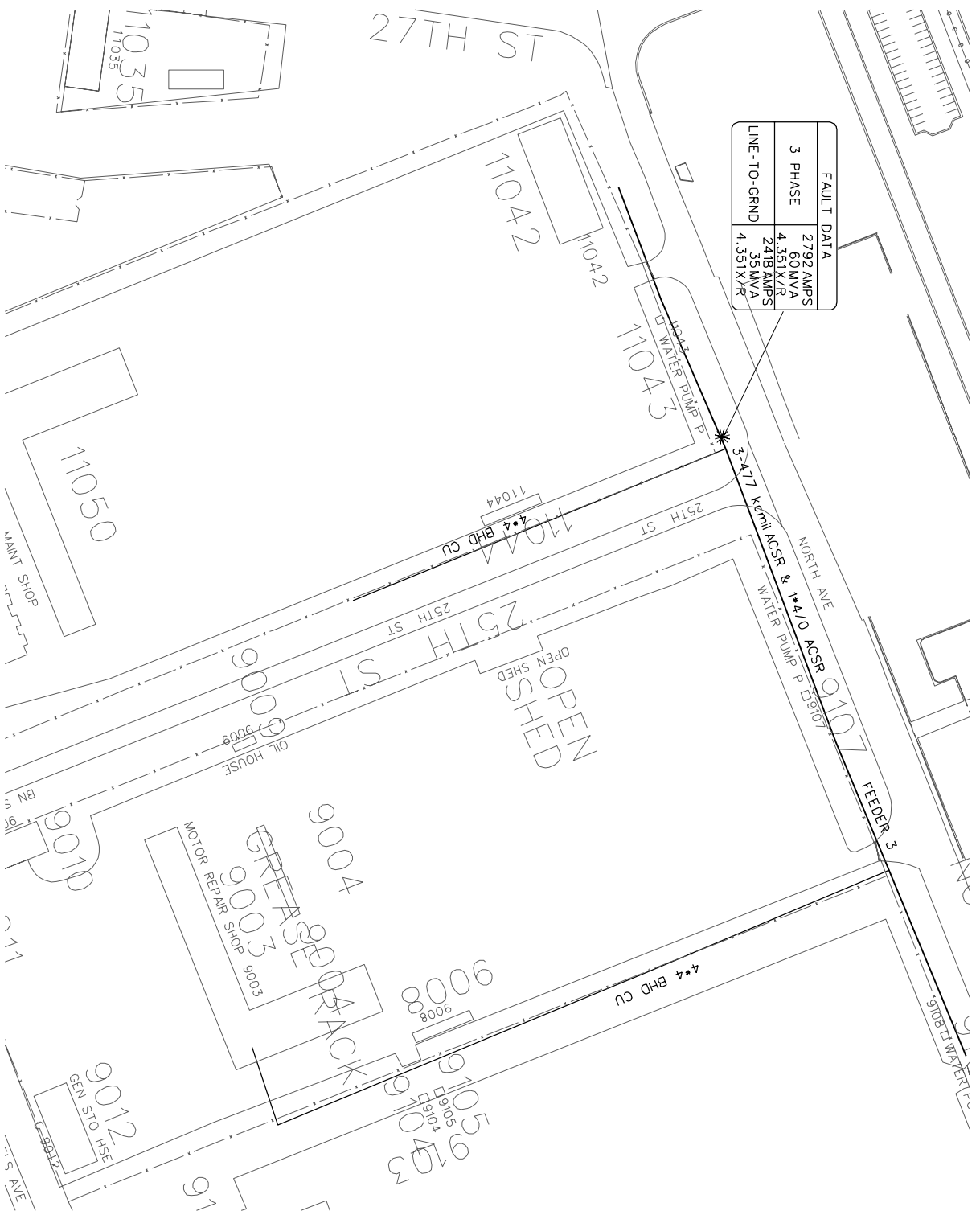
ATTACHMENT 5E
SITE 11 (TVM 41ST) & SITE 12 (TVM 37TH)



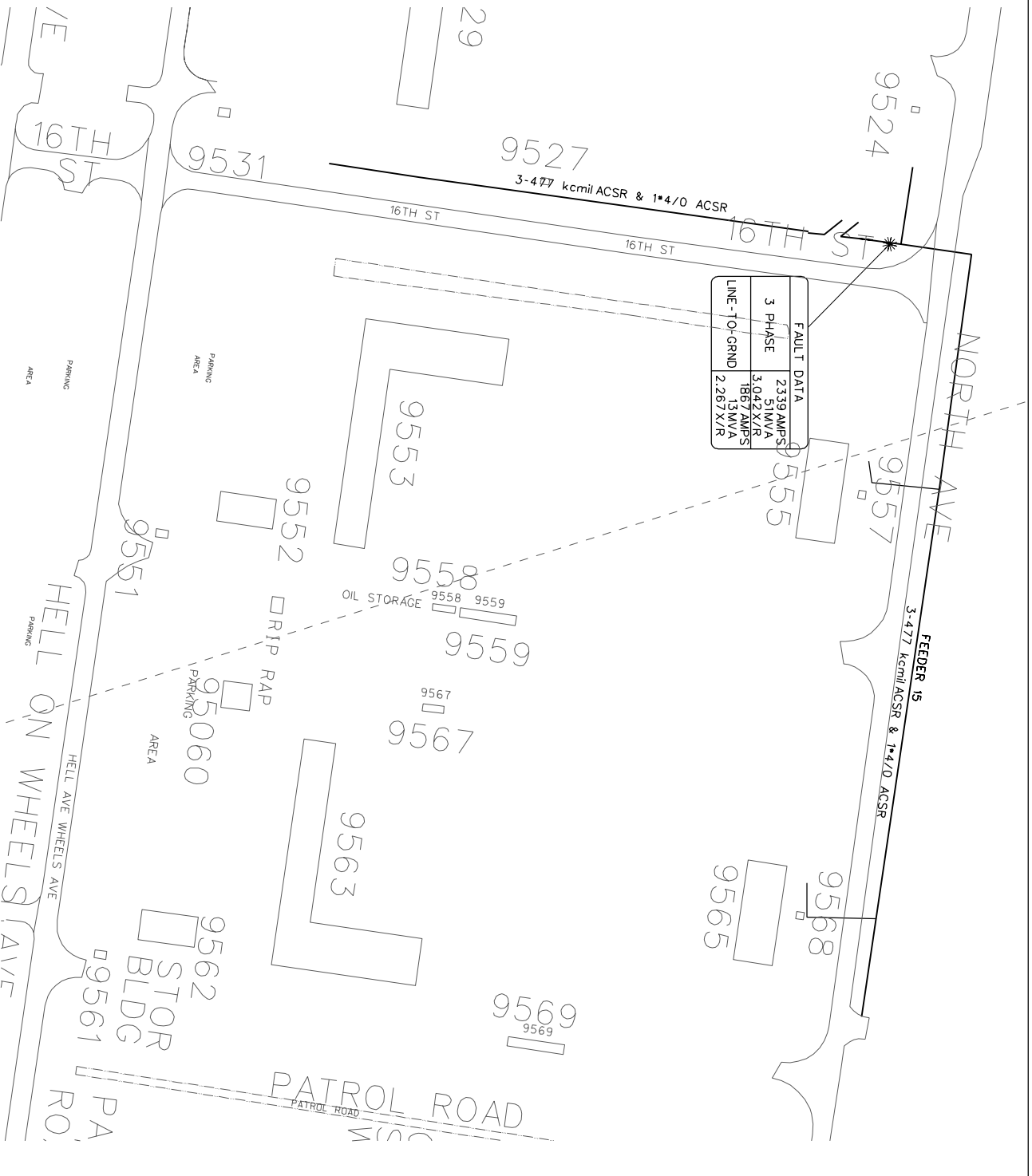
FAULT DATA			
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LINE-TO-GND	2412 AMPS	4.126 KVAR	

ATTACHMENT 6E
SITE 13 (TVM 27TH)

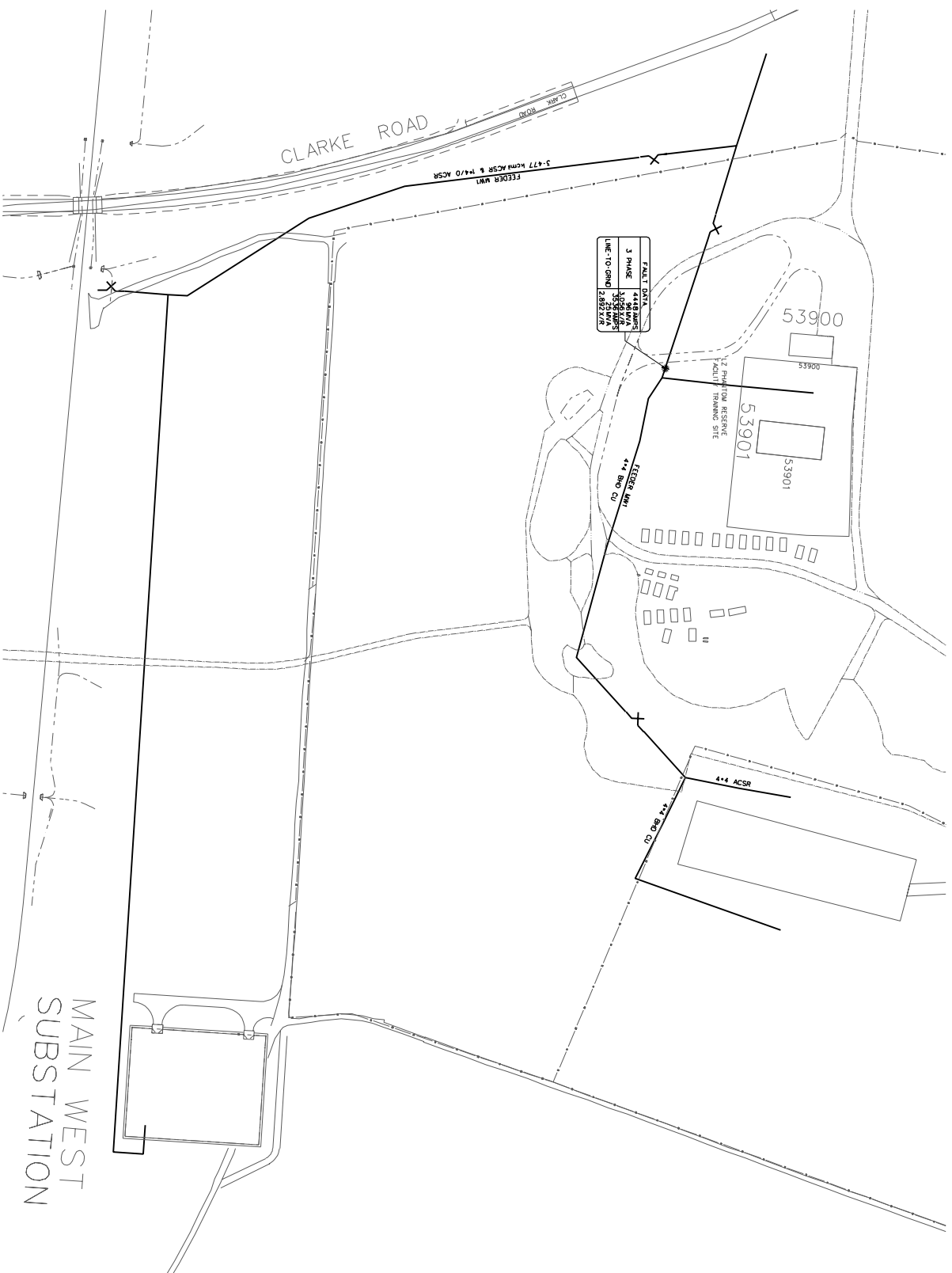
FAULT DATA			
3 PHASE	2792 AMPS		
	60 MVA		
	4.351X/R		
LINE-TO-GRND	2418 AMPS		
	35 MVA		
	4.351X/R		



ATTACHMENT 7E
SITE 14 (TVM 25TH)



ATTACHMENT 8E
SITE 15 (TVM 16TH)



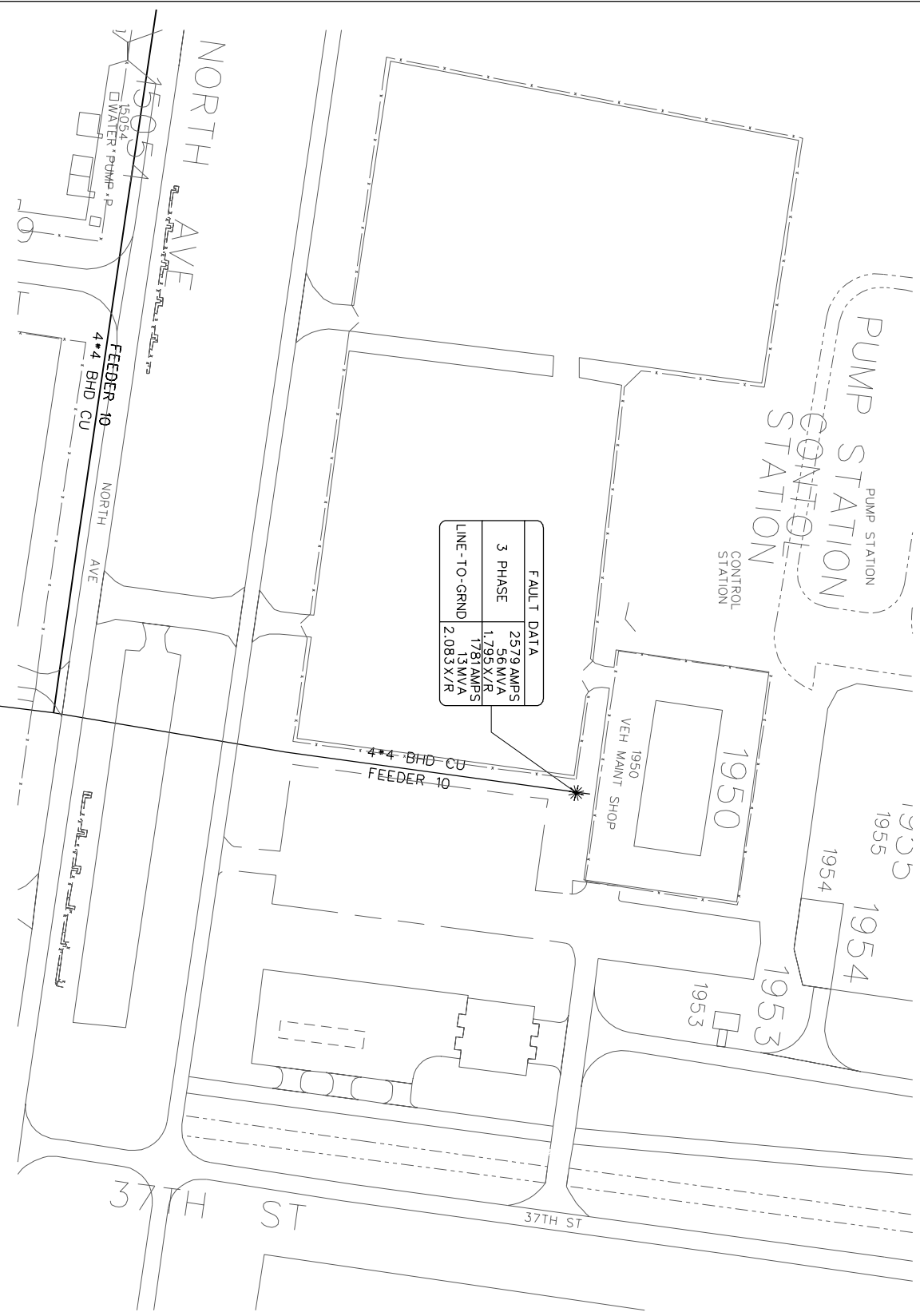
ATTACHMENT 9E
SITE 2 (LZ PHANTOM)

FAULT DATA

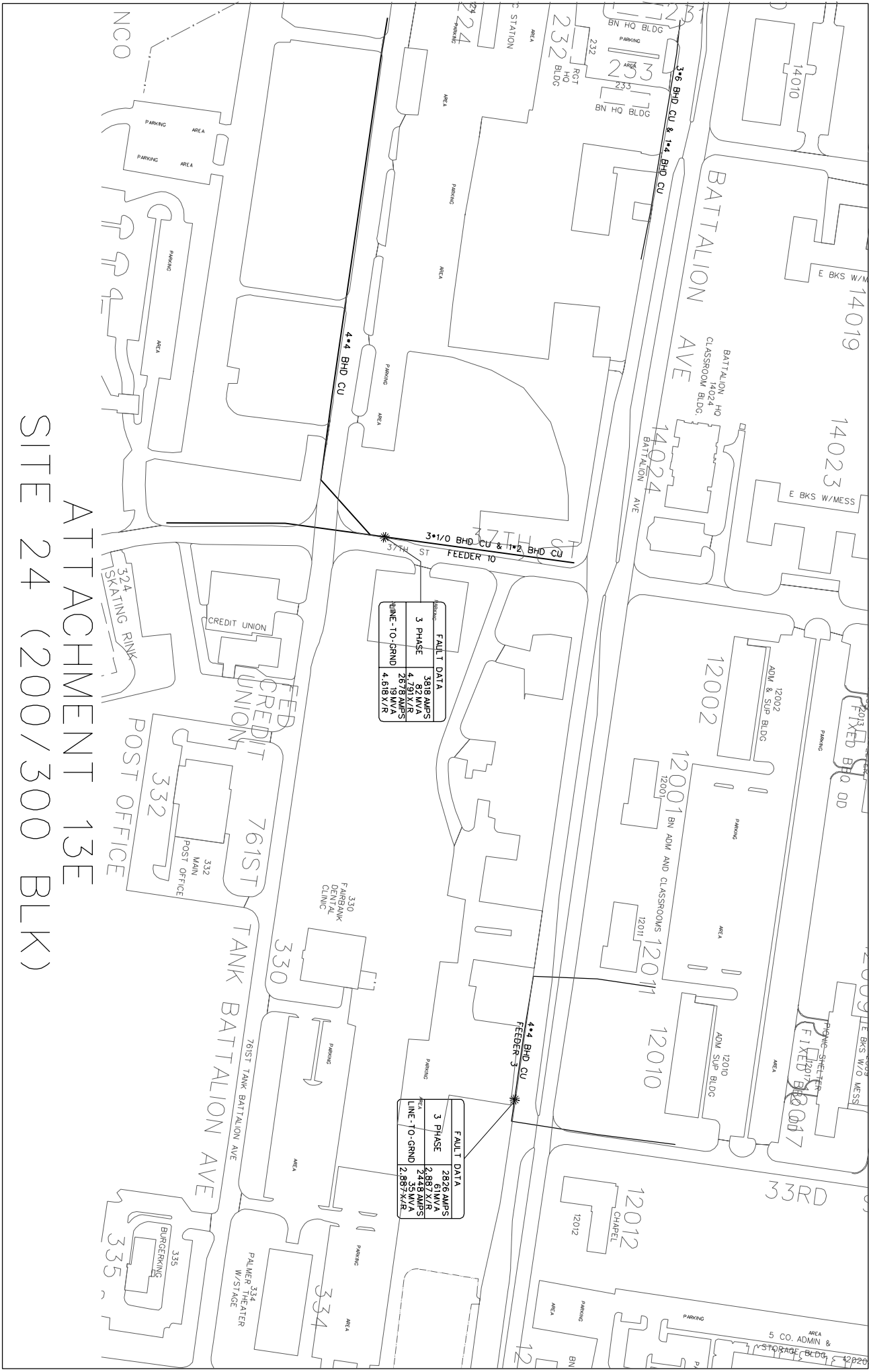
PHASE	SEISMIC	SEISMIC	SEISMIC
3	257	183	183
PHASE	257	183	183
LINE TO CHD	2.331	2.331	2.331

FAULT DATA

PHASE	SEISMIC	SEISMIC	SEISMIC
3	257	183	183
PHASE	257	183	183
LINE TO CHD	2.331	2.331	2.331

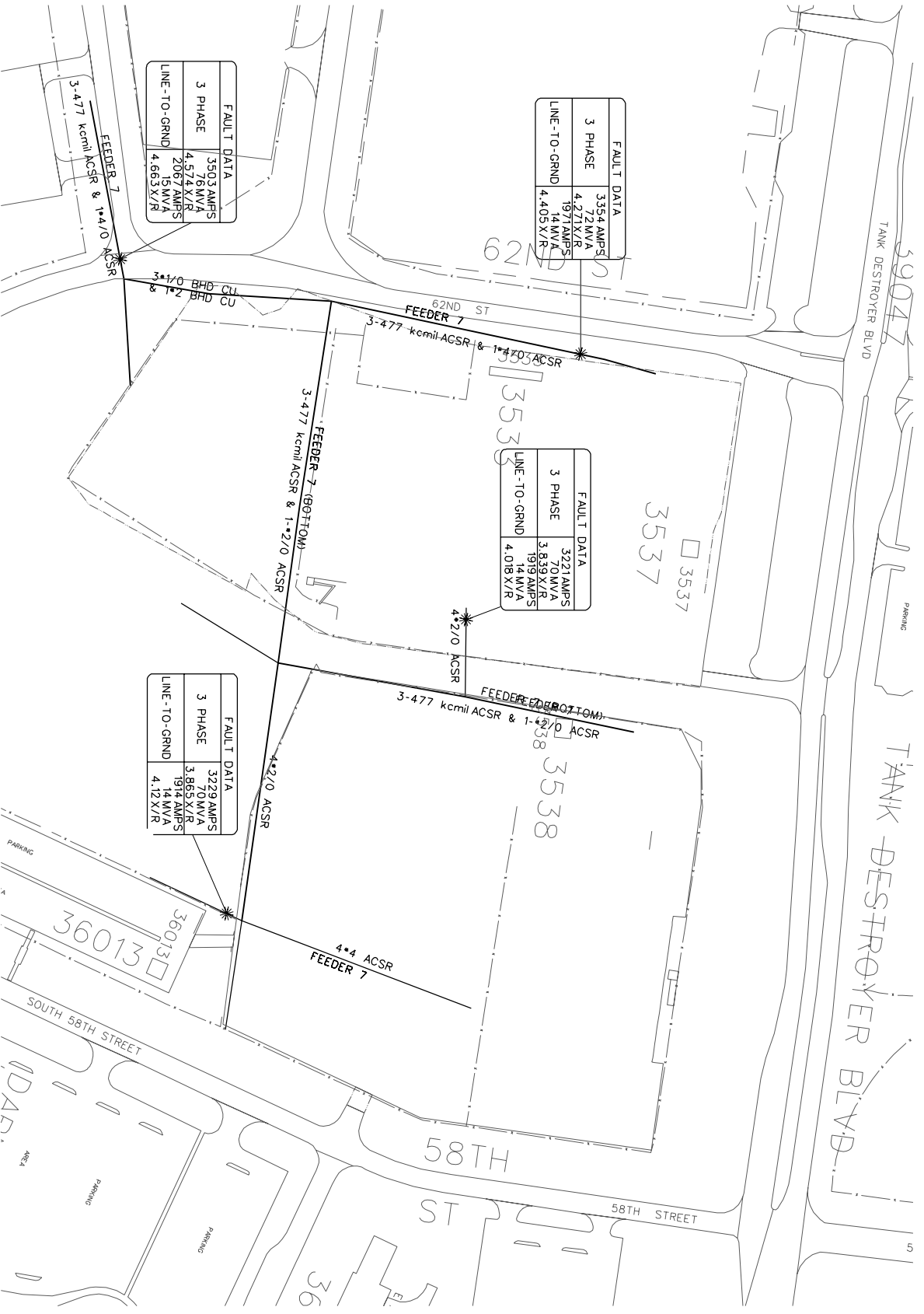


ATTACHMENT 12E
SITE 10 (1900 BLK)



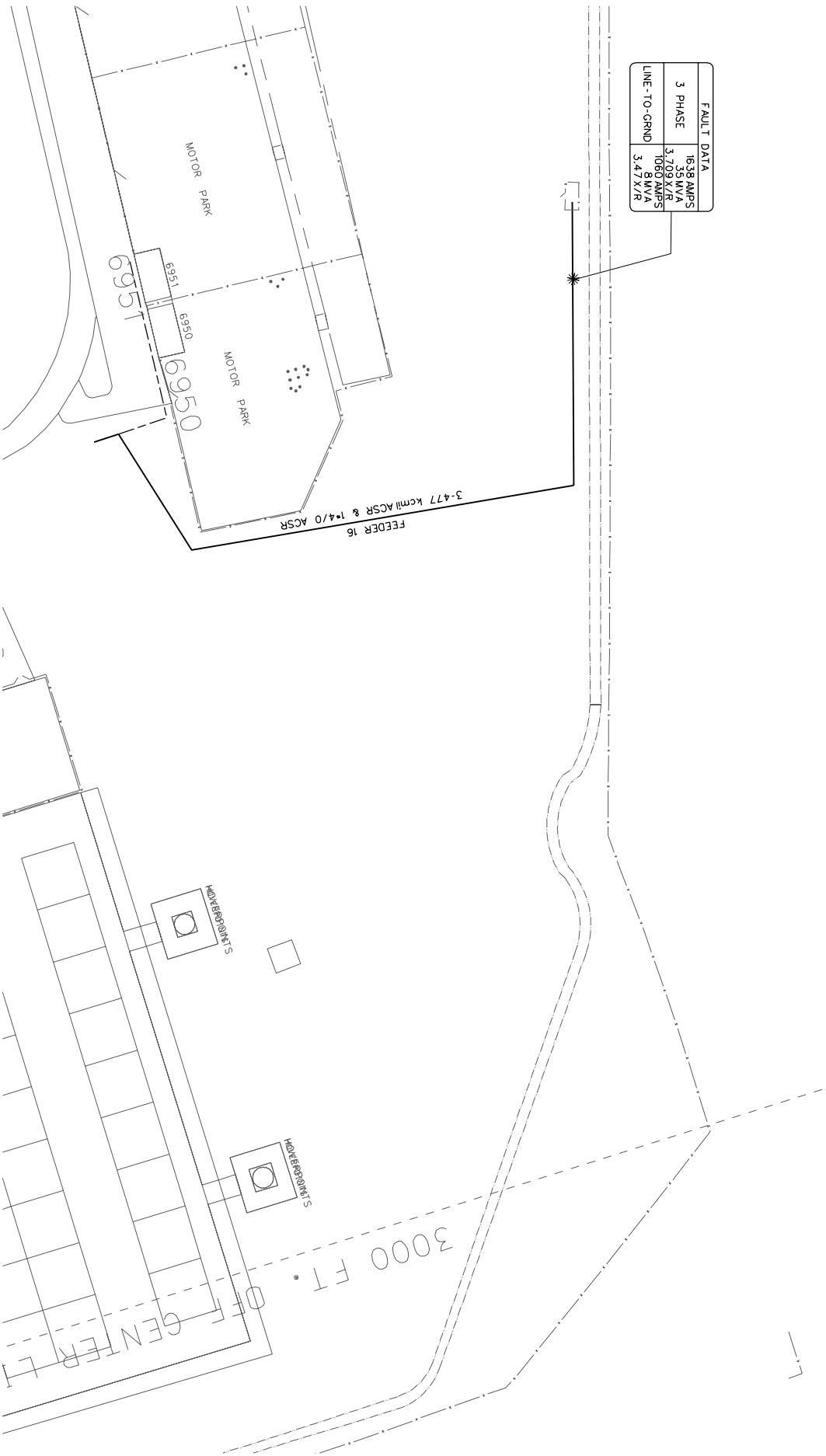
ATTACHMENT 13E

SITE 24 (200/300 BLK)



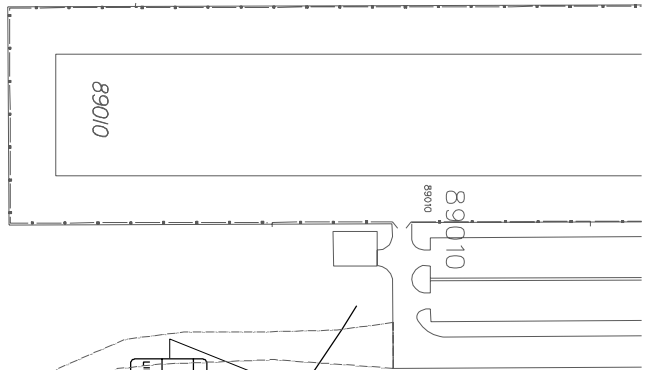
ATTACHMENT 15E
SITES 21& 22 (3500 BLOCK)

FAULT DATA			
3 PHASE	1638 AMPS	35 MVA	3.709 X/R
LINE-TO-GRND	1060 AMPS	5 MVA	3.4 X/R



ATTACHMENT 16E
SITE 30 (HAAF 700 BLK)

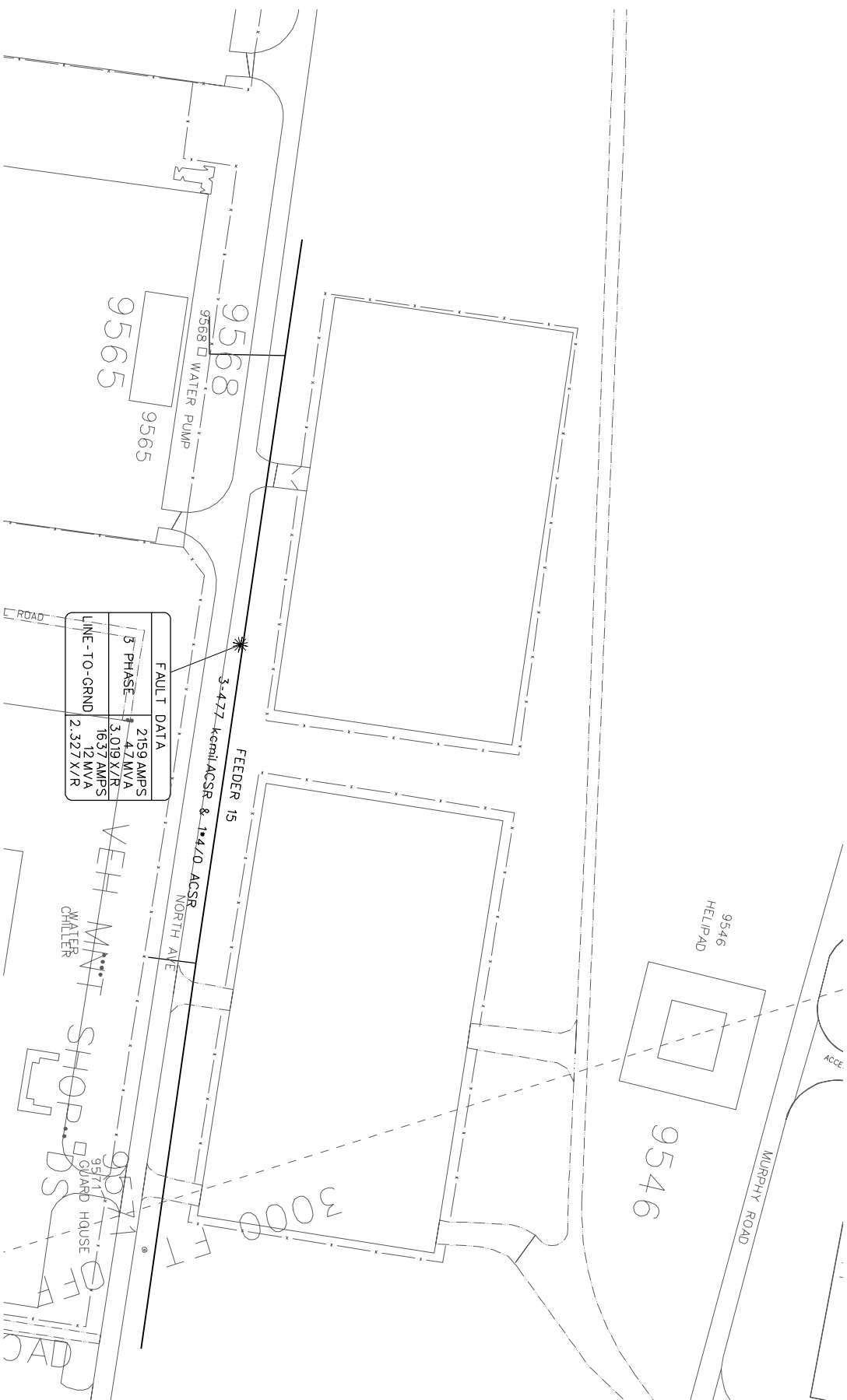
4500 FT. OFF CENTER LINE OF RUNWAY



FAULT DATA			
3 PHASE	3992 AMPS		
	3.989 KA		
	30.37 AMPS		
LINE-TO-GROUND	3.5445 V/R		

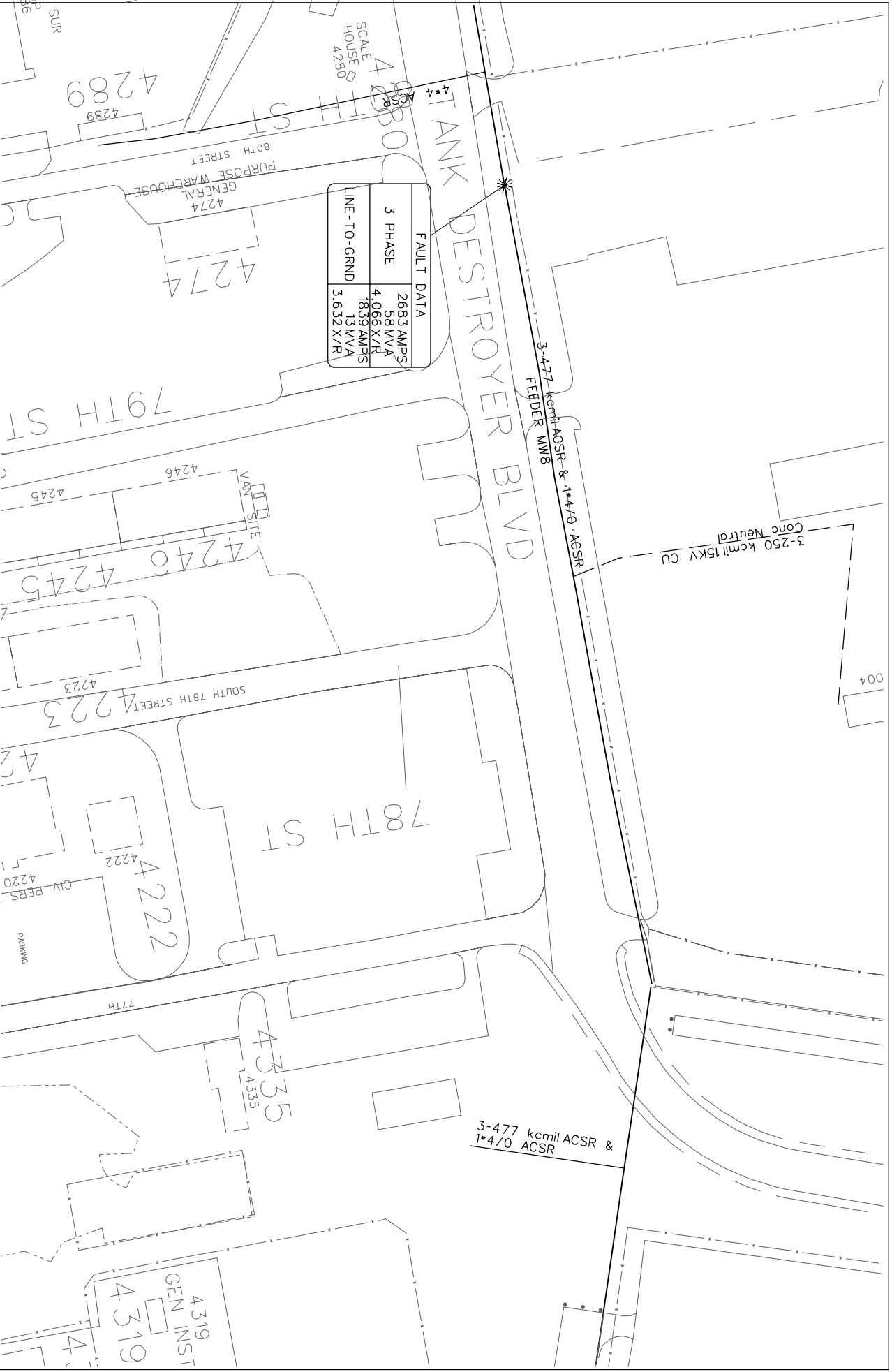
FEEDER LWH
3-477 1600 ACSS & 1410 ACSS

ATTACHMENT 17E
SITE 1 (DOL AREA)



ATTACHMENT 18E

SITES 25, 26 & 27 (9500 BLK)

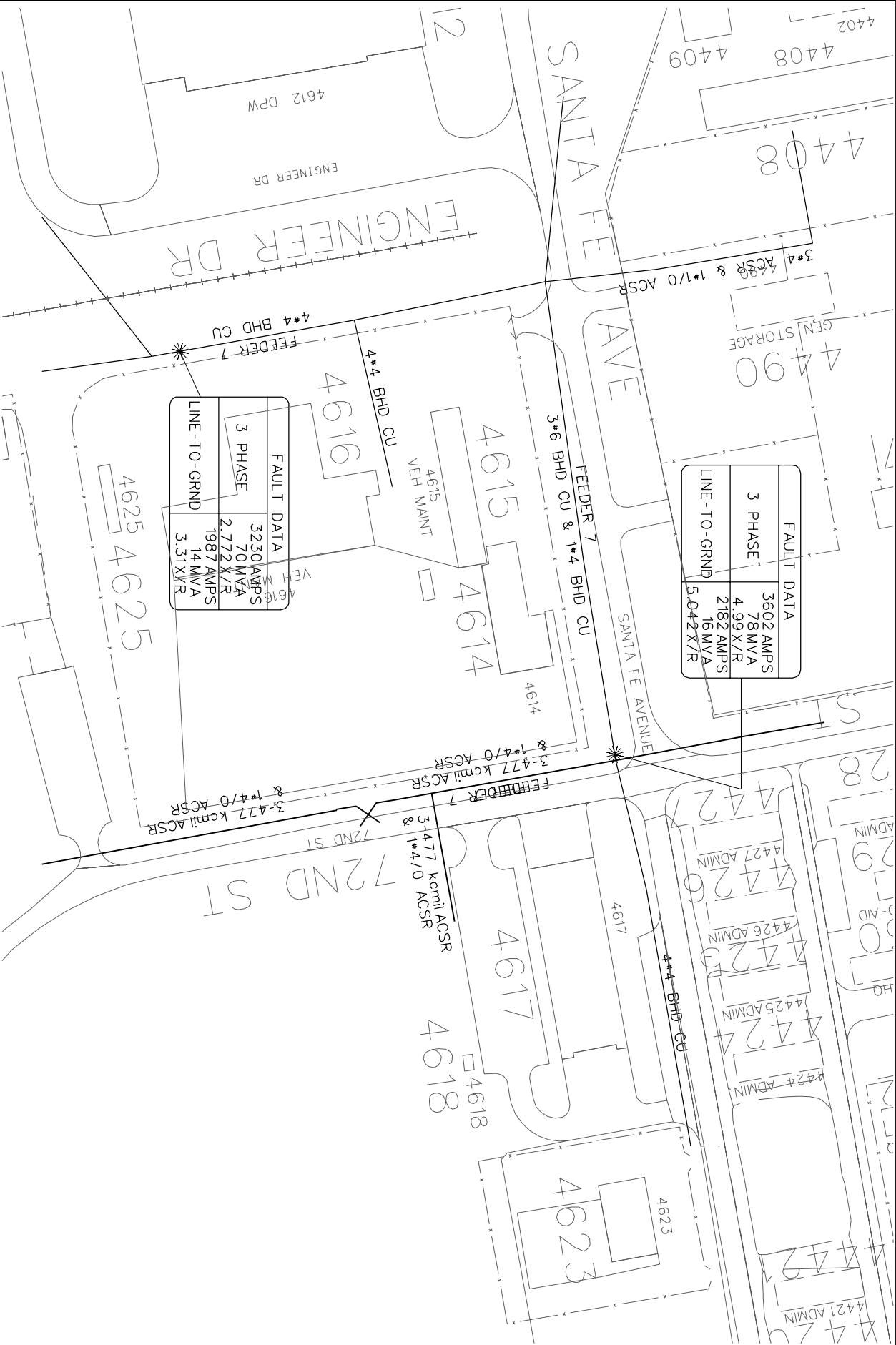


FAULT DATA	
3 PHASE	2683 AMPS
LINE-TO-GND	58 MVA
	4.066 X/R
	1839 AMPS
	13 MVA
	3.632 X/R

ATTACHMENT 19E
 SITE 20 (TANK DESTROYER & 78TH)

FAULT DATA	
3 PHASE	3602 AMPS 78 MVA 4.99 X/R
LINE-TO-GRND	2182 AMPS 16 MVA 5.042 X/R

FAULT DATA	
3 PHASE	3230 AMPS 70 MVA 2.772 X/R
LINE-TO-GRND	1987 AMPS 14 MVA 3.31 X/R

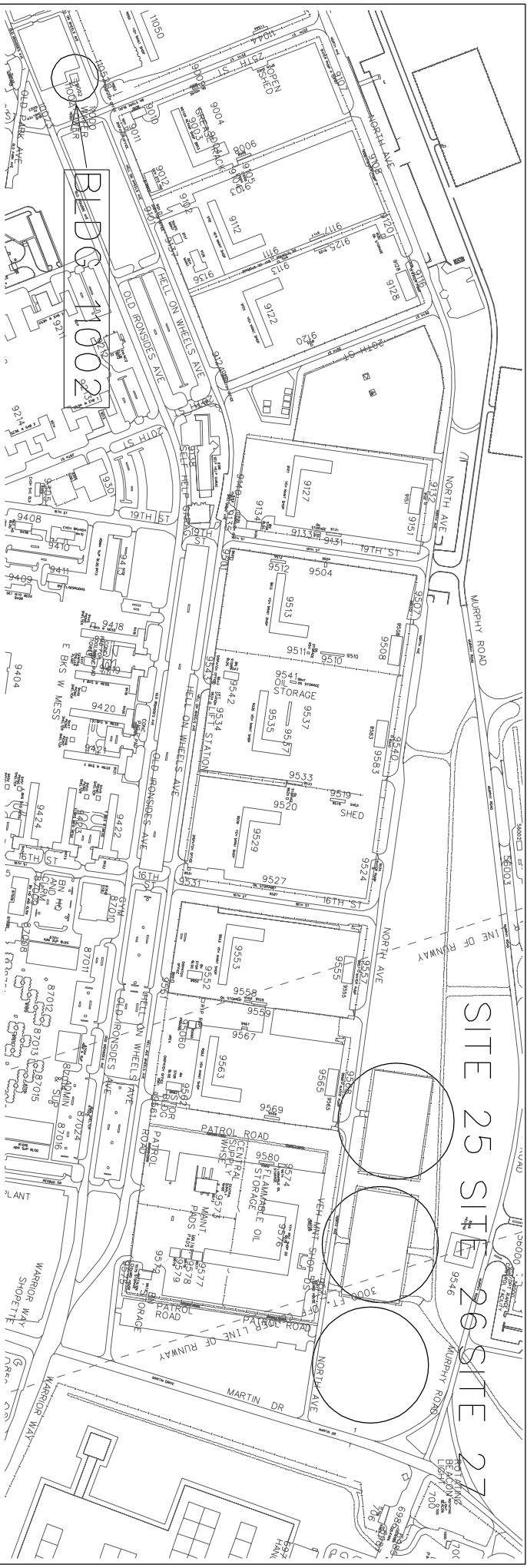


ATTACHMENT 20E
4600 BLDG AREA



ATTACHMENT 22E
COMMUNICATIONS
SITE 2 (LZ PHANTOM)

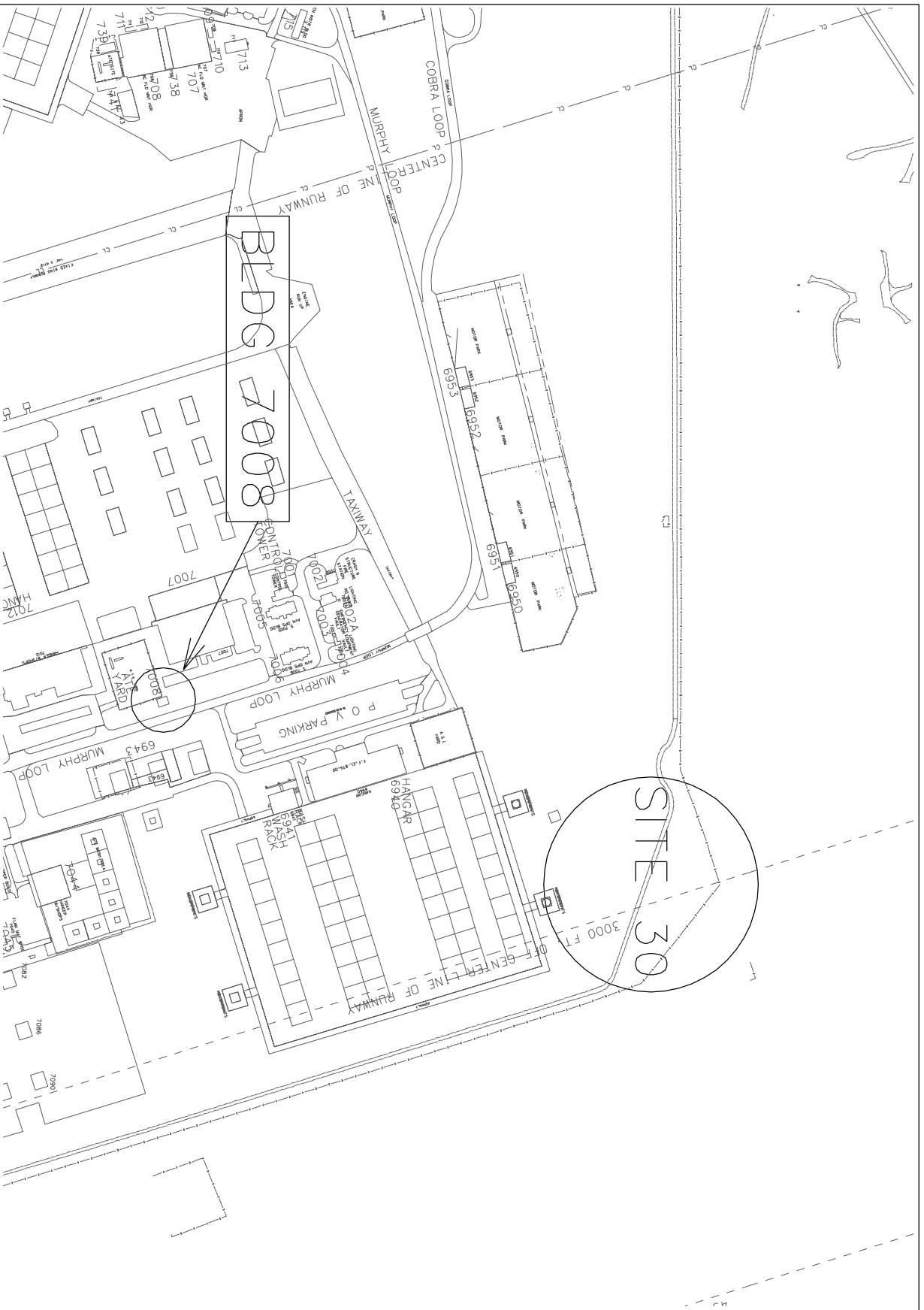




ATTACHMENT 27E
COMMUNICATIONS
SITES 25, 26, & 27 (9500 BLK)

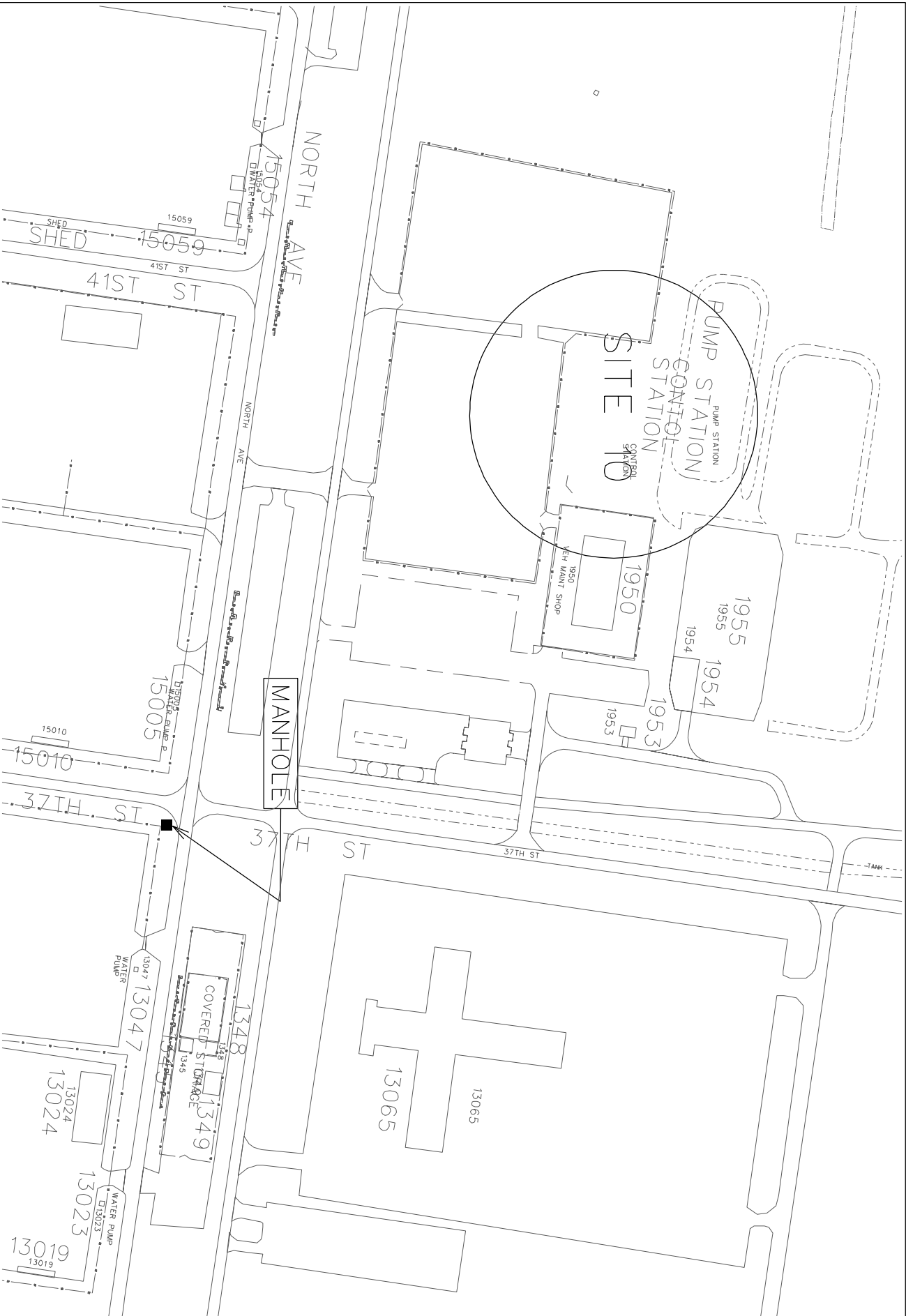


ATTACHMENT 28E
COMMUNICATIONS
SITES 8 (16000 BLK) & 9 (17000 BLK)



BECDZ

ATTACHMENT 29E
COMMUNICATIONS
SITE 30 (HAAF AREA)



ATTACHMENT 30E
COMMUNICATIONS
SITE 10 (1900 BLK)

REGULATED MATERIAL SCHEDULE																	
Priority I Buildings for Renovation																	
4ID Realignment - Company & Battalion Level Building Renovation																	
No	Bldg No	Current Alignment	New Alignment	Realignment Action/Scope	Notes/Comments	SQ FT	Asbestos			Mold	LBP	Other Regulated Materials (ORM)					
PRIORITY I - BUILDINGS							FT/Mastic	Caulks/Putties	Other	Pipe Insulation	Y/N	Light Tubes	Ballasts	Exit Signs	Smoke Detectors	Thermostats	Water Fountains
1	9418	2 CO	3 CO	Renovate HH into CO HQs - Admin. & Move Supply for 2 Cos to Basement	HH = Hammerhead	15349	None	None	None	470 SF	N	350	175	3	0	3	0
2	9421	2 CO	2 CO + 1 Bn	Renovate HH into Bn Admin HQs		15349	None	None	None	470 SF	N	350	175	3	0	3	0
3	9422	2 CO	3 CO	Renovate Supply/Storage to CO Admin & move supply for 3 CO's to basement	Limited basement storage space?	20585	None	None	None	235 SF	N	350	175	3	0	3	0
4	9423	2 CO	3 CO	Renovate Supply/Storage to CO Admin & move supply for 3 CO's to basement	Limited basement storage space?	20585	None	None	None	235 SF	N	350	175	3	0	3	0
5	9425	2 CO	3 CO	Renovate Supply/Storage to CO Admin & move supply for 3 CO's to basement	Limited basement storage space?	20585	None	None	None	235 SF	N	350	175	3	0	3	0
6	9424	2 CO	4 CO	Renovate Supply/Storage to CO Admin. Renovate HH to CO Admin & move supply for 4 CO's to basement	Limited basement storage space?	20585	None	None	None	235 SF	N	350	175	3	0	3	0
7	10022	2 CO	3 CO	Renovate HH into CO Admin	No space in basement	15349	None	None	None	47 SF	N	184	92	4	5	0	0
8	10016	2 CO	2 CO	Renovate HH DFAC to classroom	No space in basement	15349	None	8 SF	None	47 SF	N	184	92	4	5	0	0
9	10018	2 CO	2 CO + 1 Bn	Renovate HH into Bn Admin HQs	No space in basement	15349	None	None	None	47 SF	N	184	92	4	5	0	0
10	10001	2 CO	2 CO + 1/2 Bn	Renovate HH into Bn Admin HQs	No space in basement	15349	None	None	None	47 SF	N	184	92	4	5	0	0
11	10002	2 CO	2 CO + 1/2 Bn	Renovate HH into Bn Admin HQs	No space in basement	15349	None	None	None	47 SF	N	184	92	4	5	0	0
12	10003	2 CO	2 CO + 1/2 Bn	Renovate HH into Bn Admin HQs	No space in basement	15349	1620 SF	8 SF	None	47 SF	N	184	92	4	5	0	0
13	10004	2 CO	2 CO + 1/2 Bn	Renovate HH into Bn Admin HQs	No space in basement	15349	1620 SF	8 SF	None	47 SF	N	184	92	4	5	0	0
14	10006	2 CO	2 CO + 1/2 Bn	Renovate HH into Bn Admin HQs	No space in basement	15349	1620 SF	8 SF	None	47 SF	N	184	92	4	5	0	0
15	10007	2 CO	2 CO + 1/2 Bn	Renovate HH into Bn Admin HQs	No space in basement	15349	1620 SF	8 SF	None	47 SF	N	184	92	4	5	0	0
16	9410	Classroom	Bn Aid Station	Renovate HH into a Bn aid station		3997	None	None	None	0	N	0	0	0	0	0	0
17	9427	Admin. Gen. Purp.	1/2 CO	Renovate Admin Area into shared CO HQs	ACM/LBP Issues?	2578	None	3 SF	None	0	N	28	14	0	2	1	0
18	16010	CO HQ Bldg.		Renovate for 89th PM's		12,180	4128 SF FT/Mastic & Carpet	11 SF	4128 SF Sheetrock Ceiling	0	3000 SF	744	372	6	0	12	6
Notes: 1. Sheetrock wall system sampled in Building 10003, two halon tanks are located in Building 10007 former kitchen area																	
2. See General Notes on the Priority III Buildings sheet																	

REGULATED MATERIAL SCHEDULE																	
Priority II Buildings for Renovation																	
4ID Realignment - Company & Battalion Level Building Renovation																	
No	Bldg No	Current Alignment	New Alignment	Realignment Action/Scope	Notes/Comments	SQ FT	Asbestos			Mold	LBP	Other Regulated Materials (ORM)					
PRIORITY II - BUILDINGS							FT/Mastic	Caulks/Putties	Other	Pipe Insulation	Y/N	Light Tubes	Ballasts	Exit Signs	Smoke Detectors	Thermostats	Water Fountains
19	12003	2 CO	3 CO	Renovate Supply/Dayroom to CO Admin & move supply for 3 CO's to basement	Limited basement storage space?	14635	None	None	None	15 SF	N	78	39	2	0	1	0
20	12004	2 CO	3 CO	Renovate Supply/Dayroom to CO Admin & move supply for 3 CO's to basement	Limited basement storage space?	14635	None	None	None	15 SF	N	78	39	3	0	1	0
21	12008	2 CO	3 CO	Renovate Supply/Dayroom to CO Admin & move supply for 3 CO's to basement	Limited basement storage space?	14635	None	None	None	15 SF	N	90	45	3	0	1	0
22	9419	2 CO	2 CO + 1 Bn	Renovate HH into Bn Admin HQs	HH	15349	None	None	None	470 SF	N	350	175	3	0	3	0
23	10020	2 CO	2 CO + 1 Bn	Renovate HH into Bn Admin HQs	No space in basement	15349	None	None	None	47 SF	N	184	92	4	5	0	0
24	10021	2 CO	2 CO + 1 Bn	Renovate HH into Bn Admin HQs	No space in basement	15349	None	None	None	47 SF	N	184	92	4	5	0	0
25	10008	2 CO	3 CO	Renovate HH into CO Admin	No space in basement	15349	None	8 SF	None	47 SF	N	184	92	4	5	0	0
26	10009	2 CO	2 CO + 1 Bn	Renovate HH into Bn Admin HQs	No space in basement	15349	None	None	None	47 SF	N	184	92	4	5	0	0
27	10010	2 CO	2 CO + 1/2 Bn	Renovate HH into Bn Admin HQs	No space in basement	15349	None	None	None	47 SF	N	184	92	4	5	0	0
28	10011	2 CO	2 CO + 1/2 Bn	Renovate HH into Bn Admin HQs	No space in basement	15349	None	None	None	47 SF	N	184	92	4	5	0	0
29	10005	2 CO	3 CO?	Renovate HH into Bn Admin HQs	Bio - Medical Storage?	15349	None	None	5 LF Pipe Insulation	47 SF	N	184	92	4	5	0	0
30	87009	Brigade HQs	2 Bn HQs	Renovate Admin Area		12381	12381 SF	13 SF	None	470 SF (Legal Room)	N	96	48	6	0	4	0
31	10033	Admin. Gen. Purp.	Server Room	Renovate Admin area to a server room	Requires Doim Coordination	3383	None	3 SF	100 SF Duct Insulation, 5 LF Pipe Insulation	0	N	64	32	2	0	2	0
Notes: 1. Duct insulation mastic sampled in Building 10008 2. See General Notes on the Priority III Buildings sheet																	

REGULATED MATERIAL SCHEDULE																	
Priority III Buildings for Renovation																	
4ID Realignment - Company & Battalion Level Building Renovation																	
No	Bldg No	Current Alignment	New Alignment	Realignment Action/Scope	Notes/Comments	SQ FT	Asbestos			Mold	LBP	Other Regulated Materials (ORM)					
	PRIORITY III - BUILDINGS						FT/Mastic	Caulks/Putties	Other	Pipe Insulation	Y/N	Light Tubes	Ballasts	Exit Signs	Smoke Detectors	Thermostats	Water Fountains
32	9420	2 CO + Aid Station	2 CO + 1 Bn	Renovate HH Aid Station into Bn HQs		15349	None	None	None	235 SF	N	350	175	3	0	3	0
33	9413	6 CO	6 CO	Renovate Admin/Shop Area		14710	20160 SF	15 SF	None	0	N	708	354	6	0	12	1
34	12002	5 CO	5 CO	Renovate Admin/Shop Area		12134	20160 SF	12 SF	None	0	50 SF	350	175	6	0	12	1
35	12010	5 CO	5 CO	Renovate Admin/Shop Area		12180	20160 SF	12 SF	None	0	N	350	175	6	0	12	1
36	12019	5 CO	5 CO	Renovate Admin/Shop Area		12179	20160 SF	12 SF	None	0	N	350	175	6	0	12	1
37	12020	5 CO	5 CO	Renovate Admin/Shop Area		23624	1278 SF	24 SF	None	0	N	1240	620	4	5	12	1
38	10040	Classroom	Admin	Renovate classroom area into Admin		3383	None	3 SF		0	50 SF	130	65	6	0	0	0
							4208 SF										
39	10045	Admin. Gen. Purp.	1 CO	Renovate Admin Area in CO HQs	ACM/LBP Issues?	3803	FT/Mastic & Carpet	4 SF		0	N	164	82	2	0	1	0
40	9426	Admin. Gen. Purp.	1/2 CO	Renovate Admin Area into shared CO HQs	ACM/LBP Issues?	2578	None	3 SF	None	0	N	28	14	0	2	1	0
41	90038	Dining Facility	Admin	Renovate Building for 504 MI		7471	1784 SF	7 SF	5 SF Sink Undercoating	0	N	82	41	5	0	3	1
42	4614			Renovate Building			None	1 SF		0	N	0	0	0	0	0	0
43	4615			Renovate Building			None	5 SF	6 SF Exhaust Damper	0	50 SF	84	42	0	0	1	0
44	4616			Renovate Building			1158 SF	23 SF	None	0	50 SF	272	136	0	0	1	0
45	4617			Renovate Building			3245 SF	14 SF	None	0	N	110	55	0	0	1	0
Note: Window caulk and glaze sampled at Building 10045, Building 90038 also contains 5 emergency lights, 5 halon tanks, 2 walk-in coolers																	
General Notes:																	
1. LBP Y or N requires workers protection per OSHA, protection of occupants and enviroment per SECTION 13282																	
2. Mold in linear feet located on 6-inch diameter chilled water line pipe insulation in basements																	
3. Presumed quantity of asbestos cement (transite) pipe includes 300 LF of 4-6 inch diameter lines and 100 LF of 8-12 inch lines																	
4. Contractor shall not abate caulks/putties unless performing exterior renovation																	
5. Contractor shall verify all quantities with COR for each site and building																	
6. Verify renovation and demolition scope of work in other parts of contract																	

4ID Realignment - Company & Battalion Level Building Demolition

Building Number	Asbestos Containing Material			Other Regulated Materials	
	FT/Mastic	Sheetrock	Pipe Insulation	Light Tubes	Ballasts
4452	4800 SF			194	97
4465	4800 SF			194	97
4466	4800 SF			194	97
4467	4800 SF			194	97
4468	2450 SF		100 LF	118	59
4473	2450 SF		100 LF	118	59
4475	2450 SF		100 LF	118	59
4476	2450 SF	160 SF	100 LF	118	59

NOTES:

1. Oxychloride floor surfacing and tar paper under FT/Mastic is presumed ACM
2. Contractor shall verify all quantities with COR for each site and building
3. See General Notes on Priority III Renovation Buildings sheet

APPENDIX K

RELOCATABLE FACILITIES FUNCTIONAL REQUIREMENTS

APPENDIX K

RELOCATABLE FACILITIES
FUNCTIONAL REQUIREMENTS

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K13	TACTICAL VEHICLE MAINTENANCE (TVM)
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K15	VEHICLE MAINTENANCE

K1 ADMINISTRATION FACILITIES

1. ARCHITECTURAL ADMINISTRATIVE FACILITIES

Provide X ea 1536 SF single story relocatable facilities with open office area and toilets. Provide ramp and stoop at entry, and stairs and stoops from exit to grade level.

Admin Offices 3 @ 100 SF ea

Open Office 1000 SF. 10 EA workstations plus file cabinets, printer, fax and photocopier.

Restrooms & Staff Shower 2 @ 100 SF ea. Provide ADA compliant restrooms for males and females. Male restrooms shall include 1 lavatory, 1 urinal, 1 toilet, and 1 private shower with dressing area. Female restrooms shall include 1 lavatory, 1 toilet, and 1 private shower with dressing area. The private shower is for active duty staff use and does not have to be handicapped accessible. Provide a premolded shower stall with shower curtain or door; Seamless resilient flooring with drains in the dressing areas, and the main toilet areas.

Janitor's Closet 1 @ 15 SF. Constructed from noncombustible materials, and positive latching on door. Provide resilient flooring with floor drain.

Water Heater Closet 1 @ 10 SF ea. Constructed from noncombustible materials, and positive latching on door opening to interior of living unit. Provide resilient flooring with floor drain.

The Admin facility shall be pre-fabricated, furnished, relocatable structures that meet these functional requirements. They consist of two 12' x 64' trailer modules connected as a doublewide. Provide a pitched, shingled roof with gutters and downspouts. Provide an EIFS finish on the exterior that receives final finish work on site after the sections are joined. Creative solutions that minimize delivery time are encouraged. Facility costs include, but are not limited to the structure, furniture, equipment, appliances, transport, placement and anchorage, ramps/stairs/porches/skirting and utility hookup. Infrastructure and site development costs are separate.

Minimum turning radius shall be 15 feet for POV parking areas. Minimum turning radius for organizational and service vehicles shall be 25 feet except where fire truck access and semi-truck and trailer access is required (minimum turning radius of 55 feet). Minimum access drive width shall be 25 feet.

Ramps and sidewalks shall be provided for handicapped access to each Admin Facility. The number of parking spaces and site access for the physically disabled shall be two spaces per facility.

GENERAL: These requirements are the minimum. Areas indicated are net square feet, and may be exceeded. See Architectural design requirements for information regarding individual facility cost limits, room size variations and allowable solutions.

See SECTION 01010 for additional requirements.

2. STRUCTURAL - SEE SECTION 01010

3. SPECIFIC PLUMBING DESIGN REQUIREMENTS

There are no specific plumbing requirements for this facility other than the General Plumbing Design Requirements.

4. SPECIFIC HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS

Building is to be heated and cooled.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS

Automatic sprinkler system is not required for Administration Facility.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers. Provide 5 lb. ABC type fire extinguishers in accordance with NFPA 10. Refer to Architectural Design for design requirements.

Fire Alarm and Detection System. Fire Alarm and Detection System is required. Refer to Electrical Design for design requirements.

6. INTERIOR ELECTRICAL DESIGN

a. Complete and operational electrical systems including power, communication, cable television (CATV), lighting, fire detection and mass notification systems shall be provided.

b. Feeder neutrals shall be oversized and panelboards shall be equipped with 200% neutral busses. Dry-type transformers shall include a K-4 rating if non-linear loads make up more than 50% of the total load.

c. Provide Transient Voltage Surge Suppression (TVSS).

d. Provide general-purpose receptacles for interior and exterior. Ground Fault Circuit Interrupter (GFCI) shall be provided per NEC.

e. Provide dedicated computer receptacles. Computer receptacles shall consist of a quadruplex receptacle or two duplex receptacles mounted in a single 2-gang box. A receptacle shall be provided for every 80 SF of administration space excluding private offices. A minimum of two computer receptacles shall be provided in private offices for flexibility in furniture placement. Each conference room and classroom shall be provided no fewer than four computer receptacles.

f. Provide a minimum of two floor mounted 19 inch LAN racks in communication room.

g. A communication duplex outlet (data & voice) shall be provided adjacent to each computer receptacle, facsimile receptacle and common use printer receptacle. A communication simplex outlet (voice), wall

mounted 52 inches AFF, shall be provided in each electrical room, mechanical room and communications room/closet.

h. In open administrative areas a minimum of four dedicated receptacles shall be provided for copiers, facsimile machines, and common use network printers and shall be labeled "dedicated".

i. CATV outlets with type F connectors shall be provided. A 120 volt, 20-ampere duplex receptacle shall be provided adjacent to each CATV outlet. This receptacle shall be in addition to the general-purpose receptacles required.

j. Electrical outlet devices, communication outlets, CATV outlets, and all faceplates shall be white. All outlets shall be mounted 18-inch AFF unless otherwise indicated. The location of outlets shall be coordinated with the furniture plans, and meet the requirements as otherwise stated herein.

k. Provide cable tray and 1-inch minimum electrical metallic tubing (EMT) conduit system for communication and CATV systems.

l. Provide occupancy sensors for interior lighting system as required elsewhere in RFP.

m. Provide photocell for exterior luminaries.

K2 ARMS ROOM (STORAGE)

1. ARCHITECTURAL

Minimum access drive width shall be 25 feet. Minimum turning radius shall be 15 feet except where fire truck access is required. The minimum turning radius for a fire truck shall be 55 feet.

See SECTION 01010 for additional requirements.

2. STRUCTURAL - SEE SECTION 01010

3. SPECIFIC PLUMBING DESIGN REQUIREMENTS

There are no specific plumbing requirements for this facility other than the General Plumbing Design Requirements.

4. SPECIFIC HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS

Facility will be heated and cooled.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS

Automatic sprinkler system is not required for Arms room.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers. Provide 10 lb. ABC type fire extinguisher outside entrance to Arms room. See Architectural Design for design requirements

Fire Alarm and Detection System. Fire Alarm and Detection System is required. Refer to Electrical Design for design requirements.

6. ELECTRICAL DESIGN

a. A minimum of one general-purpose 120 volt, 20-ampere GFI duplex receptacle outlet shall be provided.

b. A single jack communications outlet shall be provided adjacent to the door mounted 52" above finished floor.

c. Interior lighting shall be provided.

d. An integral ICIDS II Alarm System shall be provided. Contractor shall provide the modular arms rooms manufacturer with the required specifications. These specifications can be obtained from Mr. Allen Beck of Lockheed Martin. Mr. Beck can be contacted at 512-695-4578 or 512-796-5337. In addition, a raceway shall be provided between each arms vault and a company ops facility as described in site electrical design paragraphs.

K3 BARRACKS

1. ARCHITECTURAL - SEE SECTION 01010
2. STRUCTURAL - SEE SECTION 01010
3. SPECIFIC PLUMBING DESIGN REQUIREMENTS

There are no specific plumbing requirements for this facility other than the General Plumbing Design Requirements.

4. SPECIFIC HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS

Facility will be heated and cooled.

Conditioned air shall be supplied directly to the common area. At a minimum, there shall be one thermostat per three-man module. The Barracks shall utilize a split system air conditioner with the air handler inside and the condenser outside.

Barracks Living Units shall be ventilated at 30 cfm per sleeping room.

Provide a vent hood over the cook top.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS

Automatic sprinkler protection is required for Barracks. Refer to Fire Protection Design for design requirements.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers and Cabinets. Fire Extinguishers are required. Refer to Architectural Design for design requirements.

Fire Alarm and Detection System. Fire Alarm and Detection system is required. Smoke detection is required in bedrooms. Refer to Electrical Design for design requirements.

6. ELECTRICAL DESIGN

Commercial grade luminaires with a residential appearance shall be provided in the barracks modules. Luminaires shall be provided in all barracks module rooms including walk-in closets. Low brightness wall-mounted luminaires with white lens shall be provided over vanity mirrors.

Average maintained illumination levels shall be 10 foot-candles in barrack's sleeping rooms.

There shall be a minimum of two ceiling mounted lighting fixtures switched independently.

All lighting fixtures in sleeping rooms, including toilets, shall be switched utilizing wall switches.

Electrical receptacles shall be provided in accordance with the National Electrical Code (NEC) requirements for dwelling units. Additional receptacles shall be provided as indicated herein. Receptacle circuits in sleeping rooms shall be protected with arc-fault circuit-interrupters as required by the NEC.

A minimum of one general-purpose 120 volt, 20-ampere duplex receptacle shall be provided on each wall in each room unless otherwise indicated. In rooms where walls exceed 10 feet horizontally, an additional duplex outlet shall be provided for each additional 10 feet of wall or fraction thereof. Receptacle spacing shall not exceed 10 feet. General-purpose receptacles are in addition to special purpose and dedicated outlets for special equipment.

One additional general-purpose 120 volt, 20-ampere quadruplex receptacle shall be provided on the wall next to the CATV jack.

One general-purpose 120 volt, 20-ampere, Ground Fault duplex receptacle shall be provided on the wall next to each lavatory.

Communications

There shall be a minimum of one CATV jack in each sleeping room.

There shall be a minimum of 1 telephone jack for each sleeping area.

Fire Alarm

A minihorn and smoke detector shall be provided in all barracks sleeping rooms.

In the event of an alarm condition from any initiating device, except smoke detectors in barracks sleeping rooms, all air handling units shall shut down, all notification appliances shall alert, and a signal shall be transmitted to the fire station. In the event of an alarm condition in a barrack's sleeping room smoke detector, the minihorn that is located in the same room as the detector in alarm shall sound and a trouble signal indicating room number shall be sent to the fire alarm panel and a trouble signal shall be transmitted to the fire station.

If any smoke detector or minihorn is removed from its circuit, a trouble signal shall be generated at the fire alarm control panel and a trouble signal transmitted to the fire station.

Mass Notification

There shall be a minimum of one speaker and strobe in each sleeping room.

K4 BATTALION HEADQUARTERS

1. ARCHITECTURAL

Minimum turning radius shall be 15 feet for POV parking areas. Minimum turning radius for organizational and service vehicles shall be 25 feet except where fire truck access and semi-truck and trailer access is required (minimum turning radius of 55 feet). Minimum access drive width shall be 25 feet.

Ramps and sidewalks shall be provided for handicapped access to each Admin Facility. The number of parking spaces and site access for the physically disabled shall be two spaces per facility.

See SECTION 01010 for additional requirements.

2. STRUCTURAL - SEE SECTION 01010

3. SPECIFIC PLUMBING DESIGN REQUIREMENTS

There are no specific plumbing requirements for this facility other than the General Plumbing Design Requirements.

4. SPECIFIC HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS

Facility is to be heated and cooled.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS

Automatic sprinkler system is not required for Battalion Headquarters Facility.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers. Provide 5 lb. ABC type fire extinguishers in accordance with NFPA 10. Refer to Architectural Design for design requirements.

Fire Alarm and Detection System. Fire Alarm and Detection System is required. Refer to Electrical Design for design requirements.

6. INTERIOR ELECTRICAL DESIGN

a. Complete and operational electrical systems including power, communication, cable television (CATV), lighting, fire detection and mass notification systems shall be provided.

b. Feeder neutrals shall be oversized and panelboards shall be equipped with 200% neutral busses. Dry-type transformers shall include a K-4 rating if non-linear loads make up more than 50% of the total load.

c. Provide Transient Voltage Surge Suppression (TVSS).

d. Provide general-purpose receptacles for interior and exterior. Ground Fault Circuit Interrupter (GFCI) shall be provided per NEC.

e. Provide dedicated computer receptacles. Computer receptacles shall consist of a quadruplex receptacle or two duplex receptacles mounted in a single 2-gang box. A receptacle shall be provided for every 80 SF of administration space excluding private offices. A minimum of two computer receptacles shall be provided in private offices for flexibility in furniture placement. Each conference room and classroom shall be provided no fewer than four computer receptacles.

f. Provide a minimum of two floor mounted 19 inch LAN racks in communication room.

g. A communication duplex outlet (data & voice) shall be provided adjacent to each computer receptacle, facsimile receptacle and common use printer receptacle. A communication simplex outlet (voice), wall mounted 52 inches AFF, shall be provided in each electrical room, mechanical room and communications room/closet.

h. In open administrative areas a minimum of four dedicated receptacles shall be provided for copiers, facsimile machines, and common use network printers and shall be labeled "dedicated".

i. CATV outlets with type F connectors shall be provided. A 120 volt, 20-ampere duplex receptacle shall be provided adjacent to each CATV outlet. This receptacle shall be in addition to the general-purpose receptacles required.

j. Electrical outlet devices, communication outlets, CATV outlets, and all faceplates shall be white. All outlets shall be mounted 18-inch AFF unless otherwise indicated. The location of outlets shall be coordinated with the furniture plans, and meet the requirements as otherwise stated herein.

k. Provide cable tray and 1-inch minimum electrical metallic tubing (EMT) conduit system for communication and CATV systems.

l. Provide occupancy sensors for interior lighting system as required elsewhere in RFP.

m. Provide photocell for exterior luminaries.

K5 BRIGADE HEADQUARTERS

1. ARCHITECTURAL

Minimum turning radius shall be 15 feet for POV parking areas. Minimum turning radius for organizational and service vehicles shall be 25 feet except where fire truck access and semi-truck and trailer access is required (minimum turning radius of 55 feet). Minimum access drive width shall be 25 feet.

Ramps and sidewalks shall be provided for handicapped access to each Admin Facility. The number of parking spaces and site access for the physically disabled shall be two spaces per facility.

See SECTION 01010 for additional requirements.

2. STRUCTURAL - SEE SECTION 01010

3. SPECIFIC PLUMBING DESIGN REQUIREMENTS

There are no specific plumbing requirements for this facility other than the General Plumbing Design Requirements.

4. SPECIFIC HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS

Facility is to be heated and cooled.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS

Automatic sprinkler system is not required for Brigade Headquarters Facility.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers. Provide 5 lb. ABC type fire extinguishers in accordance with NFPA 10. Refer to Architectural Design for design requirements.

Fire Alarm and Detection System. Fire Alarm and Detection System is required. Refer to Electrical Design for design requirements.

6. ELECTRICAL - SEE SECTION 01010

K6 CLASSROOM

1. ARCHITECTURAL - SEE SECTION 01010
2. STRUCTURAL - SEE SECTION 01010
3. SPECIFIC PLUMBING DESIGN REQUIREMENTS

There are no specific plumbing requirements for this building other than the General Plumbing Design Requirements.

4. SPECIFIC HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS

Building is to be air conditioned.

Provide a separate air handler for each classroom with its own thermostat.

Provide Gas heating.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS

Automatic fire sprinkler system is required for the classroom. Refer to Fire Protection Design for design requirements.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers and Cabinets. Fire extinguishers are required. Refer to Architectural Design for design requirements.

Fire Alarm and Detection System. Fire alarm and detection system is required. Refer to Electrical Design for design requirements.

6. CLASSROOM INTERIOR ELECTRICAL DESIGN

In addition to receptacles specified in the general section, two outlets shall be provided in center of each classroom to provide for connection of a projector. Each classroom shall be provided with no fewer than four quadraplex receptacles for computers.. Branch circuits serving computer receptacles shall be dedicated to computer receptacles. Each branch circuit shall supply a maximum of three computer receptacles. Branch circuits serving general-purpose receptacles shall be dedicated to general-purpose receptacles. Each branch circuit shall supply a maximum of six general-purpose receptacles. Branch circuits serving receptacles adjacent to CATV outlets shall be dedicated to these receptacles. Each branch circuit shall supply a maximum of four CATV receptacles. The location of computer receptacles and communication outlets shall be coordinated to assure a computer receptacle is provided adjacent to each communication outlet.

Provide TVSS on service entrance.

The communication system shall include a Local Area Network with duplex communications outlets throughout the building, with a communication duplex outlet provided alongside each computer receptacle, facsimile receptacle and common use printer receptacle.

Provide a CATV outlet in each classroom.

A Mass Notification System shall be provided.

A complete fire alarm system consisting of pull stations, detectors, flow and tamper switches, horns, visual indicators, control panel and fire alarm transmitter shall be provided.

Classroom lighting shall be equipped with dimmers to control each of the four sectionalized areas in each classroom.

K7 COMPANY OPERATIONS

1. ARCHITECTURAL

Minimum turning radius shall be 15 feet for POV parking areas. Minimum turning radius for organizational and service vehicles shall be 25 feet except where fire truck access and semi-truck and trailer access is required (minimum turning radius of 55 feet). Minimum access drive width shall be 25 feet.

Ramps and sidewalks shall be provided for handicapped access to each Admin Facility. The number of parking spaces and site access for the physically disabled shall be two spaces per facility.

See SECTION 01010 for additional requirements.

2. STRUCTURAL - SEE SECTION 01010

3. SPECIFIC PLUMBING DESIGN REQUIREMENTS - COMPANY OPERATIONS
RELOCATABLE

There are no specific plumbing requirements for this facility other than the General Plumbing Design Requirements.

4. SPECIFIC HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS -
COMPANY OPERATIONS RELOCATABLE

Facility is to be heated and cooled.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS - Company Ops.

Automatic sprinkler system is not required for Company Ops. Facility.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers. Provide 5 lb. ABC type fire extinguishers in accordance with NFPA 10. Refer to Architectural Design for design requirements.

Fire Alarm and Detection System. Fire Alarm and Detection System is required. Refer to Electrical Design for design requirements.

6. COMPANY OPS - INTERIOR ELECTRICAL DESIGN

Complete and operational electrical systems including power, communication, cable television (CATV), IDS system, interior and exterior lighting, fire detection and mass notification systems shall be provided.

a. Feeder neutrals shall be oversized and panelboards shall be equipped with 200% neutral busses. Dry-type transformers shall include

a K-4 rating if non-linear loads make up more than 50% of the total load.

b. Transient Voltage Surge Suppression (TVSS).

c. Provide dedicated computer receptacles. Computer receptacles shall consist of a quadruplex receptacle or two duplex receptacles mounted in a single 2-gang box. A Receptacle shall be provided for every 80 SF of administration space excluding private offices. A minimum of two computer receptacles shall be provided in private offices for flexibility in furniture placement. Each conference room and classroom shall be provided no fewer than four computer receptacles.

d. A communication duplex outlet (data & voice) shall be provided alongside each computer receptacle, facsimile receptacle and common use printer receptacle. A communication simplex outlet (voice) shall be provided, wall mounted 52 inches AFF in each electrical room, mechanical room and communications room/closet.

e. In open administrative areas a minimum of four dedicated receptacles shall be provided for copiers, facsimile machines, and common use network printers and shall be labeled "dedicated".

f. CATV outlets, type F connection, shall be provided. A 120 volt, 20-ampere duplex receptacle shall be provided adjacent to each CATV outlet. This receptacle shall be in addition to the general-purpose receptacles required.

g. General duplex receptacles devices, communication outlets, CATV outlets, and faceplates shall be white. All outlets shall be mounted 18-inch AFF unless otherwise indicated. The location of outlets shall be coordinated with the furniture plans, also assure a computer receptacle is provided adjacent to each communication outlet.

h. Provide cable tray and 3/4-inch minimum electrical metallic tubing (EMT) conduit system for communication and CATV systems.

i. Provide occupancy sensors for interior lighting system.

j. Provide photocell for exterior luminaries.

k. A 1-inch raceway shall be provided between Company Ops' communication room and arms rooms.

K8 COMPANY OPERATIONS SUPPLY BUILDING

1. ARCHITECTURAL

Minimum access drive width shall be 25 feet. Minimum turning radius shall be 15 feet except where fire truck access is required. The minimum turning radius for a fire truck shall be 55 feet.

See SECTION 01010 for additional requirements.

2. STRUCTURAL - SEE SECTION 01010

3. SPECIFIC PLUMBING DESIGN REQUIREMENTS - COMPANY OPERATIONS SUPPLY RELOCATABLE

There are no specific plumbing requirements for this facility other than the General Plumbing Design Requirements.

4. SPECIFIC HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS - COMPANY OPERATIONS SUPPLY RELOCATABLE

Facility is to be heated and cooled.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS - Company Ops. Supply Facility

Automatic sprinkler protection shall be provided for Company Ops. Supply Facility as follows:

Supply/Storage Facility. Provide sprinkler protection per the requirements of UFC 3-600-01. Per UFC 3-600-01, 6-10.1 storage facilities must have complete automatic sprinkler protection. Sprinkler protection must be based on Class IV commodities as defined by NFPA 13. See Fire Protection Design for design requirements.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers and Cabinets. Fire Extinguishers are required. Refer to Architectural Design for design requirements.

Fire Alarm and Detection System. Fire Alarm and Detection System is required. Refer to Electrical Design for design requirements.

6. COMPANY OPS SUPPLY - INTERIOR ELECTRICAL DESIGN

Complete and operational electrical systems including power, communication, cable television (CATV), lighting, fire detection and mass notification systems shall be provided.

a. Feeder neutrals shall be oversized and panelboards shall be equipped with 200% neutral busses. Dry-type transformers shall include

a K-4 rating if non-linear loads make up more than 50% of the total load.

b. Transient Voltage Surge Suppression (TVSS).

c. Provide dedicated computer receptacles. Computer receptacles shall consist of a quadruplex receptacle or two duplex receptacles mounted in a single 2-gang box. A Receptacle shall be provided for every 80 SF of administration space excluding private offices. A minimum of two computer receptacles shall be provided in private offices for flexibility in furniture placement. Each conference room and classroom shall be provided no fewer than four computer receptacles.

d. A communication duplex outlet (data & voice) shall be provided alongside each computer receptacle, facsimile receptacle and common use printer receptacle. A communication simplex outlet (voice) shall be provided, wall mounted 52 inches AFF in each electrical room, mechanical room and communications room/closet.

e. In open administrative areas a minimum of four dedicated receptacles shall be provided for copiers, facsimile machines, and common use network printers and shall be labeled "dedicated".

f. CATV outlets, type F connection, shall be provided. A 120 volt, 20-ampere duplex receptacle shall be provided adjacent to each CATV outlet. This receptacle shall be in addition to the general-purpose receptacles required.

g. General duplex receptacles devices, communication outlets, CATV outlets, and faceplates shall be white. All outlets shall be mounted 18-inch AFF unless otherwise indicated. The location of outlets shall be coordinated with the furniture plans, also assure a computer receptacle is provided adjacent to each communication outlet.

h. Provide cable tray and 3/4-inch minimum electrical metallic tubing (EMT) conduit system for communication and CATV systems.

i. Provide occupancy sensors for interior lighting system.

j. Provide photocell for exterior luminaries.

k. A 1-inch raceway shall be provided between Company Ops' communication room and arms rooms.

K9 COVERED STORAGE

1. ARCHITECTURAL

Minimum access drive width shall be 25 feet. Minimum turning radius shall be 15 feet except where fire truck access is required. The minimum turning radius for a fire truck shall be 55 feet.

See SECTION 01010 for additional requirements.

2. STRUCTURAL - SEE SECTION 01010.

3. SPECIFIC PLUMBING DESIGN REQUIREMENTS - COVERED STORAGE

No plumbing is provided for this building.

4. SPECIFIC HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS - COVERED STORAGE

Covered storage is not heated, cooled, or ventilated.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS - COVERED STORAGE

Automatic sprinkler system is not required for Covered Storage.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers. Provide 10 lb. ABC type fire extinguishers in accordance with NFPA 10. Refer to Architectural Design for design requirements.

Fire Alarm and Detection System is not required for Covered Storage.

6. COVERED STORAGE ELECTRICAL DESIGN

Receptacle Outlet Layout: A minimum of one general-purpose 120 volt, 20-ampere GFI duplex receptacle outlet shall be provided. This receptacle shall be of the type that is water proof with equipment plugged in.

Electrical outlet devices shall be white. Faceplates shall be stainless steel.

Interior Lighting: Commercial grade luminaires with a rating suitable for wet locations shall be provided.

Average maintained illumination levels in the covered storage shall be 5 foot-candles.

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K10 DAYROOM

1. ARCHITECTURAL - SEE SECTION 01010.

2. STRUCTURAL - SEE SECTION 01010.

3. SPECIFIC PLUMBING DESIGN REQUIREMENTS - DAYROOM RELOCATABLE

There are no specific plumbing requirements for this facility other than the General Plumbing Design Requirements.

4. SPECIFIC HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS - DAYROOM RELOCATABLE

Facility is to be heated and cooled.

Provide a vent hood over the cook top.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS - Dayroom

Automatic sprinkler system is not required for Dayroom Facility.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers. Provide 5 lb. ABC type fire extinguishers in accordance with NFPA 10. See Architectural Design for design requirements.

Fire Alarm and Detection System. Fire Alarm and Detection System is required. Refer to Electrical Design for design requirements.

Wet Chemical Extinguishing System. Provide a wet chemical extinguishing system in kitchen exhaust hood per the requirements of NFPA 17A.

6. DAYROOMS - INTERIOR ELECTRICAL DESIGN

Complete and operational electrical systems including power, communication, cable television (CATV), interior and exterior lighting, fire detection and mass notification systems shall be provided.

a. Feeder neutrals shall be oversized and panelboards shall be equipped with 200% neutral busses. Dry-type transformers shall include a K-4 rating if non-linear loads make up more than 50% of the total load.

b. Provide general-purpose receptacles for interior and exterior; Ground Fault Circuit Interrupter (GFCI) shall be provided per NEC.

c. Provide dedicated computer receptacles. Computer receptacles shall consist of a quadruplex receptacle or two duplex receptacles mounted in a single 2-gang box. A Receptacle shall be provided for

every 80 SF of administration space excluding private offices. A minimum of two computer receptacles shall be provided in private offices for flexibility in furniture placement. Each conference room and classroom shall be provided no fewer than four computer receptacles.

d. Provide minimum of 2 floor mounted 19 inch equipment racks in communication room.

e. Provide communication simplex outlets (voice). One outlet shall be provided in each electrical room, mechanical room and communications room/closet, wall mounted 52 inches AFF.

f. In open administrative areas a minimum of four dedicated receptacles shall be provided for copiers, facsimile machines, and common use network printers and shall be labeled "dedicated".

g. CATV outlets, type F connection, shall be provided. A 120 volt, 20-ampere duplex receptacle shall be provided adjacent to each CATV outlet. This receptacle shall be in addition to the general-purpose receptacles required.

h. General duplex receptacles devices, communication outlets, CATV outlets, and faceplates shall be white. All outlets shall be mounted 18-inch AFF unless otherwise indicated. The location of outlets shall be coordinated with the furniture plans, also assure a computer receptacle is provided adjacent to each communication outlet.

i. Provide 3/4-inch minimum electrical metallic tubing (EMT) conduit system for communication and CATV systems.

j. Provide occupancy sensors for interior lighting system.

k. Provide photocell for exterior luminaries.

K11 LAUNDRY

1. ARCHITECTURAL - SEE SECTION 01010.
2. STRUCTURAL - SEE SECTION 01010.
3. SPECIFIC PLUMBING DESIGN REQUIREMENTS - LAUNDRY RELOCATABLE

Provide natural gas for clothes dryers and natural gas hot water heaters.

4. SPECIFIC HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS - LAUNDRY RELOCATABLE

The laundry will be heated and air conditioned. The laundry indoor summer design temperature shall be 85 degrees and indoor winter design temperature shall be 55 degrees F. Include capacity allowance for fresh air quantities in accordance with ASHRAE 62-2001 Ventilation Standards.

Clothes Dryer Vents - A 4-inch diameter dryer vent shall individually and directly discharge to the exterior. Dryer vents shall not be manifolded. The vents shall be rigid aluminum with exterior wall cap and back draft damper. Vent pipes shall be a maximum of 20 feet long, with no more than three right angle elbows (with minimum radius of 6 inches), and have a maximum vertical run of 12 feet. Means shall be provided for cleaning entire length of dryer vents. Dryer vents shall not exhaust near air conditioning condensing units, entry doors, patio or balconies. Dryer vents shall not run through non-accessible spaces.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS - Laundry

Automatic sprinkler system is not required for Laundry Facility.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers. Provide 5 lb. ABC type fire extinguishers in accordance with NFPA 10. Refer to Architectural design for design requirements.

Fire Alarm and Detection System. Fire Alarm and Detection System is required. Refer to Electrical Design for design requirements.

6. LAUNDRY INTERIOR ELECTRICAL DESIGN

In addition receptacles specified in the general section, the Contractor shall install a dedicated outlet for each individual clothes washing machine, clothes drying machine, and vending machines. Additional duplex receptacles shall be installed along the walls for general plug-in loads; in accordance the length of the walls.

The communication system shall include a Local Area Network with duplex communications outlets throughout the building. One communication outlet shall be installed next to a power outlet.

A Mass Notification System shall be provided.

A complete fire alarm system consisting of pull stations, detectors, flow and tamper switches, control panel and fire alarm transmitter shall be provided.

K12 STORAGE BUILDING

1. ARCHITECTURAL

Minimum access drive width shall be 25 feet. Minimum turning radius shall be 15 feet except where fire truck access is required. The minimum turning radius for a fire truck shall be 55 feet.

See SECTION 01010 for additional requirements.

2. STRUCTURAL - SEE SECTION 01010.

3. SPECIFIC PLUMBING DESIGN REQUIREMENTS - STORAGE FACILITY

There are no specific plumbing requirements for this building other than the General Plumbing Design Requirements.

4. SPECIFIC HEATING AND VENTILATING REQUIREMENTS - STORAGE FACILITY

Provide heating with low intensity gas infrared heaters.

Heat building to 40 degrees F. for freeze protection. Include capacity allowance for fresh air quantities in accordance with ASHRAE 62-2001 Ventilation Standards.

Provide exhaust fans. Indoor summer design temperature shall be 10 degrees F above the outdoor design temperature.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS - Storage Facility

Automatic sprinkler protection shall be provided for Storage Facility as follows:

Supply/Storage Facility. Provide sprinkler protection per the requirements of UFC 3-600-01. Per UFC 3-600-01, 6-10.1 storage facilities must have complete automatic sprinkler protection. Sprinkler protection must be based on Class IV commodities as defined by NFPA 13. Refer to Fire Protection Design for additional design requirements.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers and Cabinets. Fire Extinguishers are required. Refer to Architectural Design for design requirements.

Fire Alarm and Detection System. Fire Alarm and Detection System is required. Refer to Electrical Design for design requirements.

6. STORAGE INTERIOR ELECTRICAL DESIGN

A minimum of one general-purpose 120 volt, 20-ampere duplex receptacle outlet shall be provided on each wall. It is preferred to have receptacles centered on wall and accessible without having to go into a storage cage when cages are provided. In addition to the general-purpose receptacles, two quadraplex receptacles shall be provided for computers.

Interior lighting system shall be low bay pulse-start metal halide or linear T5 or T8 fluorescent luminaires designed specifically for bay or warehouse applications.

Provide TVSS on service entrance.

The communication system shall include a Local Area Network with duplex communications outlets throughout the building.

Photocell controlled wall mounted lighting shall be provided at the entrances to all secure unit storage buildings

A complete fire alarm system consisting of pull stations, detectors, flow and tamper switches, control panel and fire alarm transmitter shall be provided.

K13 TACTICAL VEHICLE MAINTENANCE (TVM)

1. ARCHITECTURAL

The Vehicle Maintenance facilities will be built from pre-manufactured components, furnished, and relocatable to meet these functional requirements. These facilities will be clear span sprung structures built from standard components. Creative solutions that minimize delivery time are encouraged. Facility costs include, but are not limited to the structures, components, furniture, equipment, appliances, transport, placement, anchorage, and utility hookup. Infrastructure and site development costs are separate.

Minimum turning radius onto hardstand from the tank trail shall be 30 feet. Minimum tank trail extension width shall be 30 feet. Minimum access drive width from the tank trail onto the hardstand shall be 28 feet. Minimum POV access drive width shall be 25 feet. Minimum POV turning radius shall be 25 feet from 15th Street to the POV access drive.

See SECTION 01010 for additional requirements.

2. STRUCTURAL - SEE SECTION 01010.

3. SPECIFIC PLUMBING DESIGN REQUIREMENTS - TVM

There are no specific plumbing requirements for this building other than the General Plumbing Design Requirements.

4. SPECIFIC HEATING, VENTILATING, AND AIR CONDITIONING REQUIREMENTS - TVM

TVM is not heated, cooled, or ventilated.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS - TVM

Automatic sprinkler system is not required for TVMs.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers. Provide 10 lb. ABC type fire extinguishers in accordance with NFPA 10. Refer to Architectural Design for design requirements.

Fire Alarm and Detection System is not required for TVMs.

For additional information, see the attached SPECIFICATION SECTIONS 14630 OVERHEAD ELECTRIC CRANES and 15400E PLUMBING, COMPRESSED AIR SYSTEM located at the end of this section.

6. TACTICAL VEHICLE MAINTENANCE INTERIOR ELECTRICAL DESIGN

Secondary service voltage shall be 277/480 volt, 3-phase, 4-wire for all of the TVM facilities. Dry-type transformers shall be provided to obtain 120/240 volt service for general purpose receptacles and small motors. 480 volt service to motors shall be used to the maximum extent possible in accordance with UFC 3-520-01, Interior Electrical Systems.

The drawings provide the necessary interior electrical information on what is to be installed into the facility.

SECTION 14630

OVERHEAD ELECTRIC CRANES
05/93

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN GEAR MANUFACTURERS ASSOCIATION (AGMA)

AGMA 390.03a	(1980; Errata 1983) Gear Handbook Gear Classification, Materials and Measuring Methods for Bevel, Hypoid, Fine Pitch Wormgearing and Racks Only as Unassembled Gears
AGMA 2000-A	(1988; Errata Jan 1989) Gear Classification and Inspection Handbook
AGMA 2001-B	(1995) Fundamental Rating Factors and Calculation Methods for Involute Spur and Helical Gear Teeth
AGMA 6010-E	(1988; Errata Nov 91) Standard for Spur, Helical, Herringbone and Bevel Enclosed Drives
AGMA 6019-E	(1989) Gearmotors Using Spur, Helical, Herringbone, Straight Bevel, or Spiral Bevel Gears

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC ASD MAN, Vol I	(1993) Manual of Steel Construction
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AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 159	(1983; R 1993) Automotive Gray Iron Castings
ASTM A 325	(1994) Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A 668	(1995) Steel Forgings, Carbon and Alloy, for General Industrial Use

ASTM B 438	(1995a) Sintered Bronze Bearings (Oil-Impregnated)
ASTM B 439	(1995) Iron-Base Sintered Bearings (Oil-Impregnated)
ASTM B 612	(1991) Iron Bronze Sintered Bearings (Oil-Impregnated)
ASTM B 633	(1985; R 1994) Electrodeposited Coatings of Zinc on Iron and Steel
ASTM E 125	(1963; R 1993) Magnetic Particle Indications on Ferrous Castings

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B30.2	(1990; B30.2a; B30.2b; B30.2c; B30.2d) Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)
ASME B30.16	(1993; B30.16a; B30.16b; B30.16c) Overhead Hoist (Underhung)
ASME B30.17	(1992; Errata; Sep 1993; B30.17a; B30.17b; B30.17c) Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)
ASME HST-4M	(1991) Performance Standard for Overhead Electric Wire Rope Hoists
ASME NOG-1	(1995) Rules for Construction of Overhead and Gantry Cranes

AMERICAN WELDING SOCIETY (AWS)

AWS D14.1	(1985) Welding of Industrial and Mill Cranes and Other Material Handling Equipment
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MATERIAL HANDLING INSTITUTE (MHI)

MHI CMAA 70	(1994) Electric Overhead Traveling Cranes
MHI CMAA 74	(1994) Top Running & Under Running Single Girder Electric Overhead Traveling Cranes Utilizing Under Running Trolley Hoist

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 2 (1993) Industrial Control and Systems,
Controllers, Contactors, and Overload Relays
Rated Not More Than 2,000 Volts AC or 750
Volts DC

NEMA ICS 6 (1993) Industrial Control and Systems,
Enclosures

NEMA MG 1 (1993; Rev 1; Rev 2) Motors and
Generators

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (1996) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 50 (1995; Rev Oct 1996) Enclosures for
Electrical Equipment

UL 489 (1996) Molded-Case Circuit Breakers,
Molded-Case Switches and Circuit-Breaker
Enclosures

UL 943 (1993; Rev thru Sep 1996)
Ground-Fault Circuit-Interrupters

UL 1449 (1985; Errata Apr 1986) Transient Voltage
Surge Suppressors

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Overhead Crane System; GA.

A complete list of equipment and materials, including manufacturer's descriptive data and technical literature, performance charts and curves, catalog cuts, and installation instructions.

Spare Parts; FIO.

Spare parts data for each different item of material and equipment specified, after approval of the detail drawings and not later than 1 month prior to the date of beneficial occupancy. The data shall include a complete list of parts and supplies, with current unit prices and source of

supply.

SD-04 Drawings

Overhead Crane System; GA.

Detail drawings containing complete wiring and schematic diagrams. Diagrams shall indicate each numbered wire, where wire initiates, where wire terminates, and any other details required to demonstrate that the system has been coordinated and will properly function as a unit. Drawings shall show layout and anchorage of equipment and appurtenances, and equipment relationship to other parts of the work including clearances for maintenance and operation.

SD-06 Instructions

Framed Instructions; GA.

Diagrams, instructions and safety requirements.

SD-09 Reports

Acceptance Testing; FIO.

Test reports in booklet form showing all field tests performed to adjust each component and all field tests performed to prove compliance with the specified performance criteria, upon completion and testing of the installed system. The report shall include the information as required by paragraph ACCEPTANCE TESTING.

SD-18 Records

Hooks; FIO.

Hook material and any heat treatment performed, stamped on the hook shank or documented in certification papers furnished with the hooks. Crane test data recorded on appropriate test record forms suitable for retention for the life of the crane.

SD-19 Operation and Maintenance Manuals

Overhead Crane System; GA.

Six copies of operation and six copies of maintenance manuals for the equipment furnished. One complete set prior to performance testing and the remainder upon acceptance. Operation manuals shall detail the step-by-step procedures required for system startup, operation and shutdown. Operation manuals shall include the manufacturer's name, model number, parts list, and brief description of all equipment and basic operating features. Maintenance manuals shall list routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides.

Maintenance manuals shall include piping and equipment layout and simplified wiring and control diagrams of the system as installed. Operation and maintenance manuals shall be approved prior to the field training course.

1.3 QUALIFICATION

Electric overhead cranes shall be designed and manufactured by a company with a minimum of 10 years of specialized experience in designing and manufacturing the type of overhead crane required to meet requirements of the Contract Documents.

1.4 TESTING AND INSPECTIONS

1.4.1 Pre-Delivery Inspections

Contractor shall be responsible for performance of quality control inspections, testing and documentation of steel castings, hook assembly and nuclear safety as follows.

1.4.2 Inspection of Steel Castings

Load-carrying steel castings shall be visually inspected and tested using the magnetic-particle inspection method. Allowable degree of discontinuities shall be referenced to ASTM E 125, and shall be related to service loads and stresses, critical configuration, location and type. Methods of repairing the discontinuities shall be subject to review by the Contracting Officer.

1.4.3 Inspection of Hook Assembly

Hook and nut shall be inspected by a magnetic-particle type inspection or X-rayed prior to delivery. Documentation of hook inspection shall be furnished to Contracting Officer at the field operational testing. As part of the acceptance standard, linear indications will not be allowed. Welding repairs of hook will not be permitted. A hook showing linear indications, damage or deformation will not be accepted, and shall be replaced.

1.5 DESIGN CRITERIA

Cranes shall operate in the given spaces and shall match the runway dimensions indicated. Hook coverage, hook vertical travel, clear hook height, lifting capacity, and load test weight shall be not be less than that indicated.

1.5.1 General

The hoisting equipment shall include the following:

Number of cranes, 1 each; located in each Tracked Vehicle Maintenance

Structure, with a 7.5 ton rated capacity, electric overhead traveling crane, top running type.

1.5.2 Classification

Top running crane shall be designed and constructed to MHI CMAA 74 moderate industrial service requirements for operation in non-hazardous environment with hoist in accordance with ASME HST-4M.

1.5.3 Rated Capacity and Speeds

Rated capacity of crane shall be 7.5 tons. Lower load block or assembly of hook, swivel bearing sheaves, pins and frame suspended by the hoisting ropes shall not be considered part of the rated capacity. Rated speeds in feet per minute for the hoist, bridge and trolley at the rated load shall be as follows:

Rated Speeds

<u>Description</u>	<u>Minimum</u>	<u>Maximum</u>
Main Hoist	5	15
Trolley	25	50
Bridge	33	100

1.6 DELIVERY AND STORAGE

Equipment delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variations, dirt and dust, and other contaminants.

1.7 FIELD MEASUREMENTS

Before performing any work, Contractor shall become familiar with all details of the work, verify all dimensions in the field, and submit a letter describing the results of this verification including discrepancies to the Contracting Officer and crane manufacture.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 General

Materials and equipment shall be standard products of manufacturers regularly engaged in the fabrication of complete and totally functional cranes including necessary ancillary equipment.

2.1.2 Nameplates

Nameplates shall be secured to each major component of equipment with the

manufacturer's name, address, type or style, model or catalog number, and serial number. Two bridge identification plates shall be provided, one for each side of bridge. Identified plates shall be noncorrosive metal with letters which are easily read from the floor, showing a separate number such as BC-1, BC-2, for each bridge crane.

2.1.3 Use of Asbestos Products

Materials and products required for designing and manufacturing cranes shall not contain asbestos.

2.1.4 Capacity Plates

Two capacity plates indicating the crane capacity in tons are required, one secured to each side of bridge. Each capacity plate shall be fabricated of a steel backing plate and exterior quality/fade-resistant stick-on labels with letters large enough to be easily read from the floor. Capacity plates shall be placed in a location visible to pendant operator's position after the crane has been installed.

2.1.5 Safety Warnings

Readable warning labels shall be affixed to each lift block or control pendant in a readable position in accordance with ASME B30.16, ASME B30.2 and ASME B30.17. The word "WARNING" or other legend shall be designed to bring the label to the attention of the operator. Warning labels shall be durable type and display the following information concerning safe-operating procedures: Cautionary language against lifting more than the rated load; operating the hoist when the hook is not centered under the hoist; operating hoist with twisted, kinked or damaged rope; operating damaged or malfunctioning hoist; operating a rope hoist with a rope that is not properly seated in its hoist drum groove; lifting people; lifting loads over people; and removing or obscuring the warning label.

2.1.5.1 Directional Arrows

To avoid operation of crane in the wrong direction, the words "FORWARD" and "REVERSE" and accompanying directional arrows shall be affixed in a location on the trolley and bridge which are visible and readable to the operator from pendant station. The words "FORWARD" and "REVERSE" shall agree with the markings on control pendant. Directional arrows shall not be indicated on control pendant.

2.2 STRUCTURAL MATERIALS

2.2.1 Bolts, Nuts and Washers

High-strength bolted connections shall utilize SAE Grade 5 bolts with corresponding lockwashers, nuts, etc., conforming to requirements of AISC-S329 bolts. Bolts, nuts and washers shall conform to ASTM A 325 bolts. Galvanized bolts are not acceptable.

2.2.2 Bridge Girders or Girders

Bridge girders shall be wide flange beams, standard I-Beams, reinforced beams or sections fabricated from rolled plates and shapes.

2.2.3 Bridge End Trucks

End trucks shall be the rotating or fixed axle type fabricated of structural tubes or from structural steel to provide a rigid box section structure. Jacking pads shall be provided for removal of wheel assemblies.

2.2.4 Stops and Bumpers

Crane runways and bridge girders shall be fitted with structural steel end stops. Bridge end trucks and trolley frames shall be fitted with shock-absorbing, spring or hydraulic type bumpers capable of decelerating and stopping the bridge and/or trolley within the limits stated by OSHA and MHI CMAA. Trolley end stops shall be of sufficient strength to withstand the impact of a fully loaded trolley moving at 50 percent of maximum rated travel speed.

2.2.5 Runway Rails

The runway rail size shall be as recommended by crane manufacturer.

2.2.6 Additional Provisions for Outside Service

Welded structural members on outdoor cranes shall be seal welded. Crane bridges shall be provided with parking brakes which will sufficiently hold the crane against a wind pressure of 5 psf for in-service conditions. Crane bridges shall be provided with manually-operated pin locks at each rail, designed to securely anchor the crane against a wind pressure of 30 psf for out-of-service conditions.

2.3 MECHANICAL EQUIPMENT

2.3.1 Drives

2.3.1.1 Bridge Drives

Bridge drives shall be A-4 drive arrangement as specified in MHI CMAA 70 or MHI CMAA 74. Bridge drive shall consist of a single electric motor mechanically connected through gear reduction and drive shafts to the drive wheels or separate drive motors at each end of bridge. Acceleration and deceleration shall meet the requirements specified in this section. Gears shall conform to applicable AGMA standards. Gear reducers shall be oil tight and fully enclosed with pressure or splash type lubrication. Bridge-travel limit-switches are optional.

2.3.1.2 Trolley Drives

Trolley shall be complete with a drive arrangement with a minimum of two wheels driven by an integral electric motor. Drive mechanism shall run in totally enclosed oil bath. Limit switches are optional for drive mechanism. Acceleration and deceleration controls shall meet requirements specified in this section.

2.3.2 Load Blocks

2.3.2.1 Main and Auxiliary Hoist Load Blocks

Load blocks shall be of welded steel construction. Load blocks shall be provided with hot-rolled or forged steel fixed crosshead separate from the sheave pin with swivel mounting for forged steel hook. Each lubrication fitting for sheave pins shall be an independent type recessed within the sheave pin or adequately guarded to prevent damage. The pitch diameter of the sheaves shall be not less than 16 times the rope diameter. Sheaves shall be supported by roller type bearings on steel sheave pins. Provisions for external lubrication shall be provided to allow pressure relief and purging of old grease. Sheave blocks shall be constructed to provide maximum personnel safety and to prevent the hoist rope from leaving the sheaves under normal operating condition.

2.3.2.2 Hook Assembly

Hooks shall be single barbed and shall be made of forged steel complying with ASTM A 668. Hook dimensions shall be manufacturer's standard. Hooks shall be fitted with safety latches designed to preclude inadvertent displacement of slings from the hook saddle. Painting or welding shall not be performed on the hook. Hook nut shall be secured with a removable type set screw or other similar fastener, but shall not be welded. Hooks shall be designed and commercially rated with safety factors in accordance with MHI CMAA. The hook shall be free to rotate through 360 degrees when supporting the rated load.

2.3.3 Hoisting Ropes

Hoisting ropes shall be regular lay, preformed, uncoated, improved plow steel, 6 by 37 construction, with independent wire rope core. Ropes shall be suited to meet the service requirements. Rope socketing or U-bolt clip connections shall be made in accordance with clip or rope manufacturer's recommendation, and shall be equal to or greater than the rope strength. Hoisting ropes shall be the rated capacity load plus the load block weight divided by the number of rope parts, and shall not exceed 20 percent of the certified breaking strength of rope. Hoisting ropes shall be secured to hoist drum so that no less than two wraps of rope remain at each anchorage of hoist drum at the extreme low position (limit switch stop).

2.3.4 Sheaves

Sheaves shall be of cast, forged, rolled, or welded structural steel.

Sheave grooves shall be accurately machined, smoothly finished and free of surface defects.

2.3.5 Hoist Drums

Hoist drums shall be of welded rolled structural steel, cast steel, or seamless steel pipe. Diameter of drum shall be not less than 24 times the diameter of hoist cable. Drums shall be machined and provided with right-hand and left-hand grooves to take the full run of cable for the required lift without overlapping, plus a minimum of two full wraps of cable when load is on floor. At least one groove shall remain unused when hook is at the highest position. Drum grooves shall be cut from solid stock and have sufficient depth for size of cable required. Drum flanges shall be guarded so that the cable cannot wedge between drum flange and hoist frame.

2.3.6 Gearing

Gearing shall be of the enclosed gear reducers type. Gears and pinions shall be spur, helical, or herringbone type only, and shall be forged, cast or rolled steel; open-type gearing is not acceptable. Gears and pinions shall have adequate strength and durability for the crane service class and shall be manufactured to AGMA 2001-B Quality Class 6 or better precision per AGMA 390.03a and AGMA 2000-A.

2.3.6.1 Gear Reducers

Gear reducers shall be standard items of manufacturers regularly engaged in the design and manufacture of gear reducers for Class D and G cranes or shall be integral components of standard hoists or hoist/trolley units of manufacturers regularly engaged in the design and manufacture of hoists or hoist/trolley units for Class A, B or C cranes. Gear reducers shall be designed, manufactured and rated in accordance with AGMA 6010-E, AGMA 6019-E (for trolley drives only), as applicable. Except for final reduction, the gear reduction units shall be fully enclosed in oil-tight housing. Gearing shall be designed to AGMA standards and shall operate in an oil bath. Operation shall be smooth and quiet.

2.3.7 Brakes

Brakes shall be of the shoe or disc type with thermal capacity suitable for class and service specified in this section. Shoe and disc brakes shall be spring-set and electrically-released by a continuously rated direct acting magnet. Brakes shall be self-aligning and provide for easy adjustment for torque setting and lining wear. Brake lining material shall be asbestos free. Brake wheels shall be cast iron conforming to ASTM A 159 or shall be the manufacturer's standard high-strength ductile cast-iron, provided that the material exhibits wear characteristics in the form of powdered wear particles and is resistant to heat-checking. Disc brakes shall be totally enclosed and have multiple discs with stationary releasing magnets. Brake torque shall be easily adjustable over a 2:1 torque range.

2.3.7.1 Hoist Holding Brakes

Each hoist shall be equipped with at least one holding brake. Holding brake shall be disc or shoe design, applied to one of the following: motor shaft or gear reducer shaft or rope drum. Braking system shall be designed to have zero hook lowering motion when a raise motion is initiated. Primary brake shall be a spring-set, electrically-released, disc or shoe type brake. Brake shall have a minimum torque rating of 150 percent of motor torque. Brake shall be capable of holding the rated load with zero hook drift. Primary brake shall be automatically set when controls are released or when power is interrupted. Provisions shall be made to facilitate easy brake adjustment. Hoists shall be furnished with mechanical-control braking or a power-control braking system. Typical power means include dynamic lowering, eddy-current braking, counter-torque, regenerative braking, variable frequency, and adjustable or variable voltage.

2.3.7.2 Hoist Control Brake

Each hoist shall be equipped with an integral mechanical load brake of the "Weston" type or multiple-disc type. Multiple disc-type brake shall be provided with external adjustment for wear.

2.3.7.3 Trolley Brake

Trolley braking system shall be provided with spring-applied and electrically-released shoe brakes or disc brakes. Braking system shall be automatically set when controls are released or power is interrupted. Provisions shall be made to facilitate easy brake adjustment. Brakes shall have a torque rating of at least 50 percent of trolley drive motor rated torque.

2.3.7.4 Bridge Brakes

Bridge braking system shall be provided with a spring-applied and electrically-released single shoe or disc brake for each bridge drive motor. Braking system shall be automatically set when controls are released or power is interrupted. Provisions shall be made to facilitate easy brake adjustment. Brakes shall have a torque rating of at least 50 percent of bridge drive motor rated torque.

2.3.8 Wheels

Wheels shall be manufactured of rolled or forged steel. Bridge wheels shall be double-flanged. Trolley wheels shall have straight treads. Bridge wheels shall have straight treads. Wheels shall be equipped with self-aligning double-row spherical roller-bearings of capacity as recommended by bearing manufacturer for design load of trolley or bridge.

2.3.9 Bearings

Bearings shall be antifriction type, except bearings which are subject only to small rocker motion. Equalizer sheaves shall be equipped with sintered oil-impregnated type bushings in accordance with ASTM B 438, ASTM B 439, or ASTM B 612.

2.3.10 Lubrication System

Splash-type oil lubrication system shall be provided for hoist, trolley and bridge gear cases; an oil pump shall be used on vertical-mounted gear cases exceeding two reductions. Oil pumps shall be the reversible type capable of maintaining the same oil flow direction and volume while being driven in either direction. Electric motor-driven pumps may be used when input shaft speed is too low at any operating condition to ensure adequate oil flow. In such applications, pump shall be energized whenever drive mechanism brakes are released.

2.4 ELECTRICAL COMPONENTS

2.4.1 Control Systems

2.4.1.1 Hoist Control System

Main hoist motion control system shall be two speed, with ac magnetic control of ac squirrel cage motor two speed, with ac magnetic control of ac wound rotor motor. Control shall provide for reversing, and for a mechanical load brake.

2.4.1.2 Travel Control System

Bridge and trolley motion control system shall be two speed with ac magnetic control of squirrel cage motors.

2.4.2 Power Sources

2.4.2.1 System Supply Voltage

Cranes shall be designed to be operated from a 480 volt, three-phase, 60 Hz, alternating current system power source. Energy isolating devices for such machine or equipment shall be designed to accept a lockout device in accordance with NFPA 70.

2.4.2.2 Transformers

Transformers shall be dry type suitable for the application.

2.4.3 Motors

2.4.3.1 General Requirements

Motors shall be designed specifically for crane and hoist duty. Drain

holes shall be provided at low points near each end. Inspection and service covers shall be provided with gaskets. Hardware shall be corrosion-resistant. Motors shall conform to the requirements of NEMA MG 1. One thermal sensitive device embedded in hoist motor windings shall be provided. Device and associated circuitry shall serve as an alarm activating an amber signal or pilot light visible to control stations when motor temperatures become excessive. Set point shall be set below the Class B insulation temperature limit. Thermal-sensitive device and associated circuits shall be self-restoring (automatic reset).

2.4.3.2 Main Hoist Motor

Hoist motor shall be two-speed; two-winding NEMA design D squirrel cage ac type.

2.4.3.3 Bridge and Trolley Drive Motors

Bridge and trolley drive motors shall be two-speed; two-winding NEMA design B squirrel cage ac type rated.

2.4.3.4 Motor Enclosures

Motor enclosures shall be totally enclosed, air-even frame (TEAD).

2.4.3.5 Hoist Motor Insulation and Time Rating

Hoist motors shall be provided with insulation which has a Class B/30 minute minimum motor time rating based on an 80 degree C motor temperature rise above 40 degrees C ambient, with frame size selection based on continuous ratings.

2.4.3.6 Bridge and Trolley Motor Insulation and Time Rating

Bridge and trolley drive motors shall be provided with an insulation which has a Class B/90 minute minimum motor time rating based on 85 degrees C motor temperature rise above 40 degree C ambient with frame size selection based on continuous rating.

2.4.4 Control System

A separate controller shall be provided for each motor; a duplex type for 2-motor bridge drives. Overload protection shall be in conformance with requirements of NEMA ICS 2 NFPA 70. When contactors are used for starting, stopping and reversing, contactors shall be mechanically and electrically interlocked.

2.4.4.1 Control Panels

Control panels shall be fabricated of solid sheet steel designed and constructed to conform to requirements of NEMA ICS 6 Type 3R. Control panel doors shall be hinged, equipped with gaskets and fitted with key-lock handle

design, complete with a single key to open all locks.

2.4.4.2 Main Hoist Control

Hoist motor control system shall provide two speeds in each direction with an electrically-operated, full-magnetic, across-the-line reversing type starter. Electrical and mechanical interlocks shall be used to prevent the operation of high speeds and low speeds.

2.4.4.3 Bridge and Trolley Control

Bridge and trolley main control systems shall provide two speeds in each direction with an electrically-operated, full-magnetic, across-the-line reversing type starter. Centrifugal switches shall be used in control circuit to prevent the plugging of trolley or bridge drive motors; each switch shall be arranged to set the associated drive's brake while attempts are made to plug. The bridge and trolley main control system shall be provided with reduced voltage starting for all speed points.

2.4.4.4 Drift Point

Trolley and bridge main control systems shall have a drift point between OFF and first speed control point in each direction or shall have a separate pushbutton.

2.4.5 Pendant Control Station

2.4.5.1 General

Pendant control station enclosure shall be NEMA Type 3R. Physical size of pendant shall be held to a minimum. A separate cable of corrosion-resistant chain consisting of minimum 1/4 inch wire shall be provided. Pendant station shall be attached to an auxiliary girder and shall hang vertically with bottom of pendant at 40 inches above floor. Weight of pendant shall not be supported by control cable.

2.4.5.2 Operating Pushbuttons

Operating pushbuttons shall be heavy-duty, dust-and-oil-tight type with distinctly-felt operating positions which meet requirements of NEMA ICS 2. Pendant control buttons shall be momentary pushbuttons. Pushbuttons (except the POWER-OFF button) shall be the recessed type to avoid accidental operation. Diameter of buttons shall be a size which will make operation possible with a thumb while holding the pendant with same hand. Nameplates shall be provided adjacent to each pushbutton. Barriers shall be provided on pendant between various pushbutton functions, except on elements mounted in junction box. In a multi-speed application, dual-position pushbuttons shall have a definite click-detent position for each speed. Pushbuttons shall be designed and manufactured not to hang up in control case. Pendant shall include a separate set of pushbuttons for each motion and for POWER-ON POWER-OFF. Pushbuttons shall be as follows:

POWER - OFF.
POWER - ON.
Hoist - Up.
Hoist - Down.
Bridge - East.
Bridge - West.
Trolley - North.
Trolley - South.

2.4.5.3 Light Indicators

Pilot lights shall meet heavy-duty requirements of NEMA ICS 2. One amber pilot light to indicate excessive hoist motor temperature shall be provided on pendant station. A blue pilot light shall be provided to indicate that the main contactor is energized, and a white pilot light to indicate that power is available on the load side of crane disconnect switch. A bright red mushroom head shall be provided with the POWER-OFF pushbutton.

2.4.6 Protection

2.4.6.1 Main Line Disconnect

A main line disconnect consisting of a combination circuit breaker (50,000 AIC) and non-reversing starter, starter without overloads (mainline contactor) in NEMA Type 3R enclosure shall be provided. Mainline disconnect shall be controlled by a control circuit so that all crane motions will be stopped upon mainline undervoltage, overload, control circuit fuse failure, or operation of POWER OFF pushbutton. Mainline disconnect shall be equipped with energy isolating devices designed to accept lockout devices.

2.4.6.2 Isolation Transformer

The isolation transformer shall be an SCR drive type specifically designed for cranes, with a continuous rating which will exceed that required of the sum of rated full-load full-speed KVA of hoist plus 50 percent of rated full-load full-speed KVA of trolley and bridge motors plus the rated KVA of controls. Total KVA is then multiplied by 1.05 (efficiency factor). The isolation transformer shall be connected to load side of mainline disconnect of the transformer.

2.4.6.3 Surge Protection

Surge suppressors shall meet the requirements of UL 1449. Three metal oxide varistors shall be provided on the line side of each SCR drive isolation transformer to provide transient over-voltage protection.

2.4.6.4 Circuit Breakers

Circuit breakers shall meet the requirements of UL 489.

2.4.6.5 Overloads

Alternating current circuit overload relays shall be of the ambient compensated, automatic reset, inverse time type located in all phases individual motor circuits. Overload relays shall be arranged to de-energize the associated motor on an overload condition.

2.4.7 Limit-Switches

Geared limit-switches shall be heavy-duty quick-break double-pole double-throw type conforming to NEMA ICS 2. The geared limit-switch interruption of a motion in one direction shall not prevent the opposite motion. Geared limit-switches shall reset automatically. Limit-switch housings shall be NEMA Type 4. Limit-switches shall interrupt power to the primary control systems.

2.4.7.1 Hoist Upper Limit-Switches

Two limit-switches shall be provided for each hoist. A rotating-type adjustable geared-control circuit interrupt limit-switch shall provide hoist-up limiting. A secondary hoist-upper-limit shall be provided with a weight-operated power circuit limit-switch to prevent the hoist from raising beyond the safe limit. The secondary limit-switch shall operate to interrupt power to all hoist motor conductors, set the hoist holding brakes and directly open all "raise" power circuits.

2.4.7.2 Hoist Lower Limit-Switches

Hoists shall be provided with a rotating-type adjustable geared-control circuit interrupt limit-switch for hoist-down travel limiting. The hook downward vertical travel of the hook shall be field-adjustable to approximately 6 inches above working surface.

2.4.7.3 Bridge and Trolley Travel Limit-Switches

Runway (track-type) limit-switches shall be provided for crane bridge and trolley motions to stop the bridge and trolley motions, respectively. Limit-switch actuators shall be installed on building and trolley frame to actuate the limit-switches and stop the crane bridge or trolley prior to contacting the trolley frame bumpers. Trip mechanism for trolley motion shall be located on crane runway to trip the switch before the bumper contacts the stop. Trip mechanism for bridge motion shall be located on crane runway to trip switch before bumper contacts the stop. When the switch is tripped, the switch shall permit opposite travel in the direction of stop and then automatically reset.

2.4.7.4 Rail Clamp Limit-Switches

When rail clamps are set, each rail clamp shall be furnished with a

limit-switch designed to interrupt the primary control circuits to bridge drive. A red pilot light shall be provided at control station to indicate the rail clamps are set.

2.4.8 Wiring

Wires shall be numbered or tagged at connection points. Splices shall be made in boxes or panels on terminals boards or standoff insulators. Motor loop, branch circuit and brake conductor selection shall be based on NFPA 70 for 90 degree C conductor rating on indoor cranes, and for 75 degree C conductor rating on outdoor cranes. Wire insulation shall be Type XHHW. Conductors in the vicinity of resistors and conductors connected to resistors shall be Type 5RML.

2.4.9 Electrification

2.4.9.1 Main Power Electrification

Main power electrification system shall provide power to crane starter/disconnect circuit breaker.

2.4.9.2 Crane Runway Conductors

Crane runway conductor system shall be the covered conductor bar system type designed and manufactured to meet UL requirements. Protective covers shall be the rigid or flexible self-closing type designed to cover all live conductors and shall be shaped to prevent accidental contact with conductors. Collectors shall be heavy-duty sliding shoe type compatible with the electrification system. Two tandem designed collector heads shall be provided for each conductor rail to provide redundancy.

2.4.9.3 Bridge Span Conductors

Bridge span conductor system shall be the rigid conductor/collector type. Cable loops shall not drop below the hook high position.

2.4.10 Special Requirements

2.4.10.1 Warning Horn

A solid-state electronic warning horn shall be provided on the crane. Any bridge or trolley motion shall be accompanied by a continuous series of alternating tones.

PART 3 EXECUTION

3.1 ERECTION

The entire crane erection shall be performed in accordance with manufacturer's instructions under the full-time supervision of the manufacturer's representative. Contractor shall provide a written

certificate from crane manufacturer indicating the crane is erected in accordance with manufacturer's recommendations before testing the completed installation.

3.1.1 Shop Assembly

Major crane components shall be shop assembled as completely as possible. Disassembled parts shall be match marked and electrical connections tagged after complete no-load shop testing. Parts and equipment at site shall be protected from weather, damage, abuse and loss of identification. Erection procedures shall ensure that the crane is erected without initial stresses, forced or improvised fits, misalignments, nicks of high-strength structural steel components, stress-raising welds and rough burrs. Damaged painted surfaces shall be cleaned and repainted after crane is erected.

3.1.2 Mechanical Alignment

Motors, couplings, brakes, gear boxes and drive components shall be aligned when reinstalled in accordance with manufacturer's instructions.

3.1.3 Electrical Alignment

Control system shall be aligned in accordance with manufacturer's instructions. A copy of the final alignment data shall be stored in control panel door and shall include but not be limited to timer settings, resistor tap settings, potentiometer settings, test-point voltages, supply voltages, motor voltages, motor currents and test conditions such as ambient temperature, motor load, date performed and person performing the alignment.

3.1.4 Welding

Welders, welding operations and welding procedures shall be qualified or prequalified in accordance with AWS D14.1. Welding shall be performed indoors and the surface of parts to be welded shall be free from rust, scale, paint, grease or other foreign matter. Minimum preheat and interpass temperatures shall conform to the requirements of AWS D14.1. Welding shall be performed in accordance with written procedures which specify the Contractor's standard dimensional tolerances for deviation from camber and sweep. Such tolerances shall not exceed those specified in accordance with AWS D14.1. Allowable stress ranges shall be in accordance with MHI CMAA 70. Welding of girders and beams shall conform with AWS D14.1.

3.1.5 Field Painting

Painting required for surfaces not otherwise specified, and finish painting of items only primed at the facility, shall be as specified in Section 09900 PAINTING, GENERAL. Bridge crane including bridge, trolley, hoist and all attached items shall be painted in accordance with the manufacturer's standard practice. The complete crane shall be of one

color. Bridge rail, supports and bracing shall be painted in accordance with Section 09900 PAINTING, GENERAL. Items such as surfaces in contact with the rail wheels, wheel tread, hooks, wire rope, surfaces on the electrical collector bars in contact with the collector shoes and nameplates shall not be painted

3.2 ACCEPTANCE TESTING

3.2.1 General

Contractor shall provide all personnel necessary to conduct the required testing which shall include but not be limited to crane operators, riggers, rigging gear and test weights. Testing shall be performed in the presence of Contracting Officer or his designated representative. Contractor shall notify Contracting Officer 10 days prior to testing operations. Contractor shall operate all equipment and make all necessary corrections and adjustments prior to the testing operations witnessed by Contracting Officer. A representative of the Contractor responsible for procuring and installing hoist equipment shall be present to direct the field testing. Test loads shall be compact and permit a minimum of 50 percent of vertical lift. Test loads shall be minus 0 percent to plus 5 percent of the required weight, and shall be verified prior to testing. Test weights required are 15,000 pounds (rated load), 18,750 pounds (125% of rated load) and 1500 pounds (10% of rated load). Operational testing shall not be performed until after building interior has been painted. Five copies of all test reports shall be furnished to Contracting Officer.

3.2.1.1 Test Sequence

Crane shall be tested in accordance with applicable paragraphs of this procedure in the sequence provided.

3.2.1.2 Test Data

Operating and startup current measurements shall be recorded for coils, hoist, trolley, and bridge motors using the appropriate instrumentation. Speed measurements shall be recorded as required by facility evaluation tests (normally at 100 percent load). Recorded values shall be compared with design specifications or manufacturer's recommended values and the abnormal differences shall be justified in the remarks or appropriate adjustments performed. The high temperatures or abnormal operation of any equipment or machinery shall be noted, investigated and corrected. Hoist, trolley and bridge speeds shall be recorded during each test cycle.

3.2.1.3 Equipment Monitoring

Improper operation or poor condition of safety devices, electrical components, mechanical equipment and structural assemblies shall be monitored during the load test. Defects observed to be critical during the testing period shall be reported immediately to the Contracting Officer and the testing operations shall be suspended until the defects are corrected.

During each load test and immediately following each load test, the following inspections shall be made:

- a. Inspect for evidence of bending, warping, permanent deformation, cracking or malfunction of structural components.
- b. Inspect for evidence of slippage in wire rope sockets and fittings.
- c. Check for overheating in brake operation; check for proper stopping. All safety devices including emergency stop switches and POWER-OFF pushbuttons shall be tested and inspected separately to verify proper operation of the brakes. When provided, safety accessories including warning horn shall be inspected.
- d. Check for abnormal noise or vibration and overheating in machinery drive components.
- e. Check wire rope sheaves and drum spooling for proper reeving and operation, freedom of movement, abnormal noise or vibration.
- f. Check electrical drive components for proper operation, freedom from chatter, noise, overheating, and lockout/tagout devices for energy isolation.
- g. Inspect gears for abnormal wear patterns, damage, or inadequate lubrication.
- h. Verify that locations of crane capacity plates are visible from pendant operator's position.

3.2.1.4 Hooks

Hooks shall be measured for hook throat spread before and after load test. A throat dimension base measurement shall be established by installing two tram points and measuring the distance between the tram points to within 0.4 mm. (1/64 inch.) This base dimension shall be recorded. Distance between tram points shall be measured before and after load test. An increase in throat opening by more than 1 percent from base measurement shall be cause for rejection.

3.2.2 No-Load Testing

3.2.2.1 Hoist Operating and Limit Switch Test

Load hook shall be raised and lowered through the full range of normal travel at rated speed and other crane speeds. Load hook shall be stopped below the geared limit-switch upper setting. In slow speed only, proper operation of upper and lower limit-switches for primary motions shall be verified. The test shall be repeated a sufficient number of times (minimum of 3) to demonstrate proper operation. Brake action shall be tested in each direction. Proper time-delay shall be verified between the actuation of

dual brakes.

3.2.2.2 Trolley Travel

Trolley shall be operated the full distance of bridge rails exercising all primary drive speed controls in each direction. Brake operation shall be verified in each direction. In slow speed, trolley bumpers shall contact trolley stops located on the bridge girders. In slow speed the proper operation (interrupt power, automatic reset) of the trolley limit-switches at both limits of trolley motion shall be tested.

3.2.2.3 Bridge Travel

Bridge shall be operated in each direction the full distance of runway exercising all primary drive speed controls. Brake operation shall be verified in each direction. In slow speed the proper operation (interrupt power, automatic reset) of the bridge limit-switches at both limits of bridge motion shall be tested. In slow speed the crane bridge bumpers shall contact the runway rail stops.

3.2.2.4 Hoist Loss of Power No-Load Test

Using the primary drive, hooks shall be raised to a height of approximately 12 feet or less. While slowly lowering the hook the main power source shall be disconnected, verifying that the hook will not lower and that both brakes will set.

3.2.2.5 Travel Loss of Power No-Load Test

With the hook raised to clear obstructions and trolley traveling in slow speed, the main power source shall be disconnected, verifying that the trolley will stop and the brake will set. Test shall be repeated for bridge slow speed primary drive controls.

3.2.3 Load Test

3.2.3.1 Hoist

Unless otherwise indicated, the following tests shall be performed using a test load of 125 percent (plus 5 percent, minus 0 percent) of rated load.

a. Hoist Static Load Test: Holding brakes and hoisting components shall be tested by raising the test load approximately 300 mm (1 foot) and manually releasing one of the holding brakes. Load shall be held for 10 minutes. First holding brake shall be reapplied and second holding brake released. Load shall be held for 10 minutes. Any lowering that may occur indicates a malfunction of brakes or lowering components.

b. Dynamic Load Test: Test load shall be raised and lowered through the full range operating in each speed. Machinery shall be completely stopped at least once in each direction to ensure proper brake operation.

c. Hoist Mechanical Load Brake: With test load raised approximately 1.5 m (5 feet) and with the hoist controller in the neutral position, holding brake shall be released. Mechanical load brake shall be capable of holding the test load. With holding brake in released position, test load shall be lowered (first point) and the controller shall be returned to OFF position as the test load lowers. Mechanical load brake shall prevent the test load from accelerating.

d. Hoist Loss of Power Test: After raising test load to approximately 2.5 m, (8 feet,) slowly lowering the test load, the main power source and control pushbutton shall be released verifying that the test load will not lower and that both brakes will set.

e. Trolley Dynamic Load Test: While operating the trolley the full distance of bridge rails in each direction with test load on the hook (one cycle), proper functioning of all primary drive speed control points and proper brake action shall be tested.

f. Bridge Dynamic Load Test: With test load on hook, bridge shall be operated for the full length of runway in both directions with trolley at each extreme end of bridge. Proper functioning of all primary drive speed control points and brake action shall be verified.

3.2.3.2 Trolley and Bridge Loss of Power Test

A test load of 100 to 105 percent of rated load shall be raised clear of any obstructions on operating floor. Starting at a safe distance from walls or other obstructions, a slow speed shall be selected using the trolley and bridge primary drive. While maintaining a safe distance to obstructions, the main power source shall be disconnected and brakes shall be verified to have set and that the equipment stops within the distance recommended by manufacturer.

3.2.4 Overload Tests

After the operational tests, bridge crane system and all functions of bridge crane shall be tested at 125 percent of rated load.

3.2.5 Acceleration and Deceleration Tests

The acceleration and deceleration of bridge and trolley shall be tested with approximately 10 percent of rated load at lowest possible location of hook. Bridge and trolley shall be operated to run up to high speed and then stopped without jarring or swinging the load.

3.2.6 Grounding Test

Hoist shall be tested to determine that the hoist, including hook and pendant, are grounded to building during all phases of hoist operation. The grounding of bridge and trolley shall be tested with approximately 10

percent of rated load on hook. Grounding shall be tested between hoist hook and the structure's grounding system.

3.2.7 Adjustments and Repairs

Adjustments and repairs shall be performed by Contractor under the direction of the Contracting Officer at no additional cost to the Government, until satisfactory conditions are maintained, and contract compliance is affected. After adjustments are made to assure correct functioning of the components, pertinent testing shall be repeated.

3.3 SCHEMATIC DIAGRAMS

Schematic diagrams for equipment shall be stored where indicated on drawings.

3.4 MANUFACTURER'S FIELD SERVICE REPRESENTATIVE

Contractor shall furnish a qualified experienced manufacturer's field service representative to supervise the crane installation, assist in the performance of the on site testing, and instruct personnel in the operational and maintenance features of the equipment.

3.5 FIELD TRAINING

Contractor shall conduct a training course for the operating staff. Training period shall consist of a total of 8 hours of normal working time and shall start after the system is functionally completed but prior to final acceptance. Course instructions shall cover pertinent points involved in operating, starting, stopping, and servicing the equipment, including all major elements of operation and maintenance manual. Course instructions shall demonstrate all routine maintenance operations such as lubrication and general inspection. Contracting Officer shall be given at least 2 weeks advance notice of field training.

3.6 ACCEPTANCE

Final acceptance of crane system will not be given until Contractor has successfully completed all testing operations, corrected all material and equipment defects, made all proper operation adjustments, and removed paint or overspray on wire rope, hook and electrical collector bars.

-- End of Section --

SECTION 15400E

PLUMBING, COMPRESSED AIR SYSTEM 12/90

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 36	(1991) Structural Steel
ASTM A 47	(1990) Ferritic Malleable Iron Castings
ASTM A 53	(1990b) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
ASTM A 183	(1983; R 1990) Carbon Steel Track Bolts and Nuts
ASTM A 536	(1984) Ductile Iron Castings
ASTM A 733	(1989) Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples
ASTM B 32	(1991) Solder Metal
ASTM B 42	(1992) Seamless Copper Pipe, Standard Sizes
ASTM B 43	(1991) Seamless Red Brass Pipe, Standard Sizes
ASTM B 88	(1992) Seamless Copper Water Tube
ASTM D 2000	(1990) Rubber Products in Automotive Applications
ASTM D 3139	(1989) Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
ASTM D 3212	(1989) Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME-16	(1989; Addenda: 1989, 1990, 1991) Boiler and Pressure Vessel Code; Section VIII, Pressure Vessels Division 1 - Basic
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Coverage

ASME B16.3	(1985) Malleable Iron Threaded Fittings, Classes 150 and 300
ASME B16.18	(1984) Cast Copper Alloy Solder Joint Pressure Fittings
ASME B16.22	(1989) Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
ASME B19.3	(1991) Safety Standard for Compressors for Process Industries

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C606	(1987) Grooved and Shouldered Joints
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MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-58	(1988) Pipe Hangers and Supports - Materials, Design and Manufacture
MSS SP-69 Selection and Application	(1991) Pipe Hangers and Supports -
MSS SP-73	(1991) Brazing Joints for Copper and Copper Alloy Pressure Fittings
MSS SP-83	(1987) Steel Pipe Unions Socket-Welding and Threaded

MILITARY SPECIFICATIONS (MS)

MS MIL-T-27730	(Rev A) Tape, Antiseize, Polytetrafluoroethylene, With Dispenser
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NATIONAL ASSOCIATION OF PLUMBING-HEATING-COOLING CONTRACTORS (NAPHCC)

NAPHCC-01	(1990; Supple 1991) National Standard Plumbing Code
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NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA 250	(1991) Enclosures for Electrical Equipment (1000 Volts Maximum)
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1.2 GENERAL REQUIREMENTS

1.2.1 Standard Products

Materials and equipment shall be the standard products of a manufacturer

regularly engaged in the manufacture of the products. Items of equipment shall essentially duplicate equipment that has been in satisfactory use at least 2 years prior to bid opening.

1.2.2 Verification of Dimensions

The Contractor shall become familiar with details of the work, verify dimensions in the field, and advise the Contracting Officer of any discrepancy before performing any work.

1.2.3 Code

All plumbing work shall be in accordance with NAPHCC-01, unless otherwise stated.

1.2.4 Cathodic Protection and Pipe Joint Bonding

Cathodic protection and pipe joint bonding systems shall be SACRIFICIAL ANODE.

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL DESCRIPTIONS:

SD-06 Instructions

Plumbing System; FIO.

Diagrams, instructions, and other sheets proposed for posting.

SD-09 Reports

Tests, Flushing and Sterilization; FIO].

Test reports in booklet form showing all field tests performed to adjust each component and all field tests performed to prove compliance with the specified performance criteria, completion and testing of the installed system. Each test report shall indicate the final position of controls.

SD-13 Certificates

Materials and Equipment; FIO.

Where materials or equipment are specified to comply with requirements of AGA, or ASME, proof of such compliance. The label or listing of the specified agency will be acceptable evidence. In lieu of the label or listing, a written certificate may be submitted from an approval, nationally recognized testing organization equipped to perform such services, stating that the items have been tested and conform to the requirements and testing methods of the specified agency. Where equipment is specified to conform to requirements of the ASME Boiler and Pressure Vessel Code, the design, fabrication and

installation shall conform to the code.

Bolts; FIO.

Written certification that the bolts furnished comply with the requirements of this specification, provided by the bolt manufacturer. The certification shall include illustrations of product-required marking, the date of manufacture, and the number of each type of bolt to be furnished based on this certification.

SD-19 Operation and Maintenance Manuals; FIO.

Plumbing System; FIO.

Six copies of the operation manual outlining the step-by-step procedures required for system startup, operation and shutdown. The manual shall include the manufacturer's name, model number, service manual, parts lists, and brief description of all equipment and their basic operating features. Six copies of the maintenance manual listing routine maintenance procedures, possible breakdowns and repairs. The manual shall include piping and equipment layout and simplified wiring and control diagrams of the system as installed.

1.4 ELECTRICAL WORK

Electric motor-driven equipment specified herein shall be provided complete with motors. Motors and motor controllers shall conform to the applicable requirements of Section 16415 ELECTRICAL WORK, INTERIOR. Electrical characteristics shall be as indicated.

PART 2 PRODUCTS

2.1 MATERIALS

Materials for various services shall be in accordance with TABLES I. Pipe fittings shall be compatible with the applicable pipe materials. Joints and gaskets materials shall conform to the following:

- a. Coupling for Steel Pipe: AWWA C606.
- b. Couplings for Grooved Pipe: Ductile Iron ASTM A 536 (Grade 65-45-12) Malleable Iron ASTM A 47, Grade 32510.
- c. Metal Solder: ASTM B 32, 95-5, tin-antimony.
- d. Silver Brazing Joints for Wrought and Cast Solder-Joint Fittings: MSS SP-73.
- e. PTFE Tape, for use with Threaded Metal or Plastic Pipe: MS MIL-T-27730.
- f. Rubber Gaskets for Grooved Pipe: ASTM D 2000, designation M2CA615A15B44F17Z, maximum temperature 110 degrees C (230 degrees F). 230 degrees F.
- g. Flexible Elastomeric Seals: ASTM D 3139 or ASTM D 3212.

- h. Bolts and Nuts for Grooved Pipe Couplings: Heat-treated carbon steel, ASTM A 183.

2.2 PIPE HANGERS, INSERTS, AND SUPPORTS

Pipe hangers, inserts, and supports shall conform to MSS SP-58 and MSS SP-69.

2.3 COMPRESSED AIR SYSTEM

2.3.1 Air Compressors

Air compressors shall conform to ASME B19.3. Air compressor unit shall be a factory-packaged assembly, including three phase, 460 volt motor controls, switches, wiring, accessories, and motor controllers, in a UL-listed NEMA 250, Type 4 enclosure. Tank-mounted air compressors shall be manufactured to comply with UL listing requirements. Air compressors shall have manufacturer's name and address, together with trade name, and catalog number on a nameplate securely attached to the equipment. Each compressor shall start unloaded and shall start and stop automatically at upper and lower pressure limits of the system. Guards shall shield exposed moving parts. Each compressor motor shall be provided with an across-the-line-type magnetic controller, complete with low-voltage release. In addition, a three-position "HAND-OFF-AUTOMATIC" selector switch shall be provided for each motor. An intake air filter and silencer shall be provided with each compressor. Aftercooler and moisture separator shall be installed between compressors and air receiver to remove moisture and oil condensates before the air enters the receiver. Aftercoolers shall be either air- or water-cooled, as indicated. The air shall pass through a sufficient number of tubes to effect cooling. Tubes shall be sized to give maximum heat transfer. Water to unit shall be controlled by a solenoid or pneumatic valve which opens when the compressors start and closes when the compressors shut down. Cooling capacity of the aftercooler shall be sized for the total capacity of the compressors. Means shall be provided for draining condensed moisture from the receiver by an automatic float type trap. Capacities of air compressors and receivers shall be as indicated.

2.3.2 Nonoil-Free Type Compressors

Compressors shall be two-stage, V-belt drive, capable of operating continuously against their designed discharge pressure, and shall operate at a speed not in excess of 1800 rpm. Compressors shall have the capacity and discharge pressure indicated. Compressors shall be assembled complete on a common subbase. The compressor main bearings shall be either roller or ball. The discharge passage of the high pressure air shall be piped to the air receiver with a copper pipe or tubing. A pressure gauge calibrated to 1.03 MPa (150 psi) 150 psi and equipped with a gauge cock and pulsation dampener shall be furnished for installation adjacent to pressure switches.

2.3.3 Air Receivers

Receivers shall be designed for 1.38 MPa (200 psi) 200 psi working pressure. Receivers shall be factory air tested to 1-1/2 times the working pressure. Receivers shall be equipped with valves and accessories, including pressure gauges and automatic and manual drains. The outside of air receivers may be galvanized or supplied with commercial enamel finish. Receivers shall be designed and constructed in accordance with ASME-16 and shall have the design working pressures specified herein. A display of the

ASME seal on the receiver or a certified test report from an approved independent testing laboratory indicating conformance to the ASME Code shall be provided.

2.3.4 Intake Air Supply Filter

Dry type air filter shall be provided having a collection efficiency of 99 percent of particles larger than 10 microns. Filter body and media shall withstand a maximum 862 kPa (125 psi), 125 psi, capacity as indicated.

2.3.5 Pressure Regulators

The air system shall be provided with the necessary regulator valves to maintain the desired pressure for the installed equipment. Regulators shall be designed for a maximum inlet pressure of 862 kPa (125 psi) 125 psi and a maximum temperature of 93 degrees C (200 degrees F). 200 degrees F. Regulators shall be single-seated, pilot-operated with valve plug, bronze body and trim, and threaded connections. The regulator valve shall include a pressure gauge and shall be provided with an adjustment screw for adjusting the pressure differential from 0 kPa to 862 kPa (0 to 125 psig). 0 to 125 psig. Regulator shall be sized as indicated.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

3.1.1 Compressed Air Piping (Nonoil-Free)

Compressed air piping shall be installed as specified for water piping and suitable for 862 kPa (125 psig) 125 psig working pressure. Compressed air piping shall have supply lines and discharge terminals legibly and permanently marked at both ends with the name of the system and the direction of flow.

3.1.1.1 Equipment Connection

The piping shall be extended to equipment. The supply line to each item of equipment except those which are supplied with integral stops, shall be equipped with a shut-off valve to enable isolation of the item for repair and maintenance without interfering with operation of other equipment.

3.1.1.2 Cutting and Repairing

The work shall be carefully laid out in advance, and unnecessary cutting of construction shall be avoided. Damage to building, piping, wiring or equipment as a result of cutting shall be repaired by mechanics skilled in the trade involved.

3.1.1.3 Protection to Fixtures, Materials, and Equipment

Pipe opening shall be closed with caps or plugs during installation. Fixtures and equipment shall be tightly covered and protected against dirt, water, chemicals, and mechanical injury. Upon completion of the work, the fixtures, materials, and equipment shall be thoroughly cleaned, adjusted, and operated.

3.1.2 Joints

Installation of pipe and fittings shall be made in accordance with the manufacturer's recommendations.

3.1.3 Pipe Sleeves and Flashing

Pipe sleeves shall be furnished and set in their proper and permanent location.

3.1.4 Sleeve Requirements

Pipes passing through concrete or masonry walls or concrete floors or roofs shall be provided with pipe sleeves fitted into place at the time of construction.

3.1.5 Supports

3.1.5.1 General

Pipe guides and anchors shall be installed to keep pipes in accurate alignment, to direct the expansion movement, and to prevent buckling, swaying, and undue strain. All piping subjected to vertical movement when operating temperatures exceed ambient temperatures, shall be supported by variable spring hangers and supports or by constant support hangers. In the support of multiple pipe runs on a common base member, a clip or clamp shall be used where each pipe crosses the base support member. Spacing of the base support members shall not exceed the hanger and support spacing required for an individual pipe in the multiple pipe run.

3.1.5.2 Pipe Supports and Structural Bracing, Seismic Requirements

All piping and attached valves shall be supported and braced to resist seismic loads.

3.1.5.3 Pipe Hangers, Inserts, and Supports

Pipe hangers, inserts and supports installation shall conform to MSS SP-58 and MSS SP-69, except as modified herein.

- a. Types 5, 12, and 26 shall not be used.
- b. Type 3 shall not be used on insulated pipe.
- c. Type 18 inserts shall be secured to concrete forms before concrete is placed. Continuous inserts which allow more adjustment may be used if they otherwise meet the requirements for type 18 inserts.
- d. Type 18 and 23 C-clamps shall be torqued per MSS SP-69 and have both locknuts and retaining devices, furnished by the manufacturer. Field-fabricated C-clamp bodies or retaining devices are not acceptable.
- e. Type 20 attachments used on angles and channels shall be furnished with an added malleable-iron heel plate or adapter.
- f. Type 24 may be used only on trapeze hanger systems or on fabricated frames.

- g. Type 39 saddles shall be used on all insulated pipe 100 mm (4 inches) 4 inches and larger when the temperature of the medium is 15 degrees C (60 degrees F) 60 degrees F or higher. Type 39 saddles shall be welded to the pipe.
- h. Type 40 shields shall:
 - (1) be used on all insulated pipe less than 100 mm (4 inches).4 inches.
 - (2) be used on all insulated pipe 100 mm (4 inches) 4 inches and larger when the temperature of the medium is 15 degrees C (60 degrees F) 60 degrees F or less.
 - (3) have a high density insert for pipe 50 mm (2 inches)2 inches and larger. High density inserts shall have a density of 128 kg per cubic meter (8 pcf) 8 pcf or greater.
- i. Horizontal pipe supports shall be spaced as specified in MSS SP-69 and a support shall be installed not over one foot from the pipe fitting joint at each change in direction of the piping. Pipe supports shall be spaced not over 1.5 m 5 feet apart at valves. Use 49 degrees C (120 degrees F) 120 degrees F for PVC pipe and 82 degrees C (180 degrees F) 180 degrees F for CPVC as operating temperatures in determining hanger spacing for PVC or CPVC pipe.
- j. Vertical pipe shall be supported at each floor, except at slab-on-grade, and at intervals of not more than 4.5 m, 15 feet, not more than 2.4 m 8 feet from end of risers, and at vent terminations.
- k. Type 35 guides using steel, reinforced polytetrafluoroethylene (PTFE) or graphite slides shall be provided to allow longitudinal pipe movement. Slide materials shall be suitable for the system operating temperatures, atmospheric conditions, and bearing loads encountered. Lateral restraints shall be provided as needed. Where steel slides do not require provisions for lateral restraint the following may be used.
 - (1) on pipe 100 mm (4 inches) 4 inches and larger when the temperature of the medium is 15 degrees C (60 degrees F) 60 degrees F or higher, a Type 39 saddle, welded to the pipe, may freely rest on a steel plate.
 - (2) on pipe less than 100 mm (4 inches) 4 inches a Type 40 shield, attached to the pipe or insulation, may freely rest on a steel plate.
 - (3) on pipe 100 mm (4 inches) 4 inches and larger carrying medium less than 15 degrees C (60 degrees F) 60 degrees F a Type 40 shield, attached to the pipe or insulation, may freely rest on a steel plate.
- l. Pipe hangers on horizontal insulated pipe shall be the size of the outside diameter of the insulation. The insulation shall be continuous through the hanger on all pipe sizes and applications.

- m. Where there are high system temperatures and welding to piping is not desirable, then the type 35 guide shall include a pipe cradle, welded to the guide structure and strapped securely to the pipe. The pipe shall be separated from the slide material by at least 100 mm, 4 inches, or by an amount adequate for the insulation, whichever is greater.

3.2 VIBRATION-ABSORBING FEATURES

Compressors shall be isolated from the building structure by approved vibration-absorbing features, unless otherwise shown. Each foundation shall include an adequate number of standard isolation units. Each unit shall consist of machine and floor or foundation fastening, together with intermediate isolation material, and shall be a standard product with printed load rating. Piping connected to mechanical equipment shall be provided with flexible connectors.

3.2.1 Tank- or Skid-Mounted Compressors

Floor attachment shall be as recommended by compressor manufacturer.

3.2.2 Foundation-Mounted Compressors

Foundation attachment shall be as recommended by the compressor manufacturer. Foundation shall be as recommended by the compressor manufacturer, except the foundation shall weigh not less than 3 times the weight of the moving parts. The compressor manufacturer's general arrangement and foundation plans, together with dimensions and specifications, shall be submitted for approval by the Contracting Officer.

3.3 PAINTING

Painting of pipes, hangers, supports, and other iron work is specified in Section 09900 PAINTING, GENERAL.

3.4 TESTS, FLUSHING, AND STERILIZATION

3.4.1 Compressed Air Piping (Nonoil-Free)

Piping systems shall be filled with oil-free dry air or gaseous nitrogen to 1.03 MPa (150 psig) 150 psig and hold this pressure for 2 hours with no drop in pressure.

3.4.2 Defective Work

If inspection or test shows defects, such defective work or material shall be replaced or repaired as necessary and inspection and tests shall be repeated. Repairs to piping shall be made with new materials. No caulking of screwed joints or holes will be acceptable.

TABLE I

PIPE AND FITTING MATERIALS FOR COMPRESSED AIR SYSTEMS

Item No.	Pipe and Fitting Materials
1	Malleable-iron threaded fittings, galvanized, ASME B16.3 for use with Item 3
2	Grooved pipe couplings, ASTM A 36 and ASTM A 47
3	Steel pipe: a. Seamless, galvanized, ASTM A 53, Type S, Grade B b. Seamless, black, ASTM A 53, Type S, Grade B
4	Seamless red brass pipe, ASTM B 43
5	Seamless copper pipe, ASTM B 42
6	Seamless copper water tube, ASTM B 88 - Type? K O L
7	Wrought copper and bronze solder-joint pressure fittings, ASME B16.22 for use with Item 6
8	Cast copper alloy solder-joint pressure fittings, ASME B16.18 for use with Item 6
9	Carbon steel pipe unions, socket-welding and threaded, MSS SP-83
10	Nipples, pipe threaded ASTM A 733
-- End of Section --	

K14 UNIT STORAGE BUILDING

1. ARCHITECTURAL UNIT STORAGE FACILITY

Provide X ea 1536 SF single story relocatable facilities. Provide exterior double doors with direct vehicle access for loading and unloading. Resilient flooring. Provide separate smaller storage areas with padlockable wire mesh partitions off main area as follows:

Unit Storage (800 SF)

NBC Storage (200 SF)

Commo Storage (200 SF)

Issue Office (200 SF) Gypsum board walls with lockable dutch door.

Janitor's Closet 1 @ 15 SF. Constructed from noncombustible materials, and positive latching on door. Provide resilient flooring with floor drain.

Water Heater Closet 1 @ 10 SF ea. Constructed from noncombustible materials, and positive latching on door opening to interior of living unit. Provide resilient flooring with floor drain.

The Unit Storage facility shall be pre-fabricated, furnished, relocatable structures that meet these functional requirements. They consist of two 12' x 64' trailer modules connected as a doublewide. Provide a pitched, shingled roof with gutters and downspouts. Provide an EIFS finish on the exterior that receives final finish work on site after the sections are joined. Creative solutions that minimize delivery time are encouraged. Facility costs include, but are not limited to the structure, furniture, equipment, appliances, transport, placement and anchorage, ramps/stairs/porches/skirting and utility hookup. Infrastructure and site development costs are separate.

Minimum access drive width shall be 25 feet. Minimum turning radius shall be 15 feet except where fire truck access is required. The minimum turning radius for a fire truck shall be 55 feet.

GENERAL: These requirements are the minimum. Areas indicated are net square feet, and may be exceeded. See Architectural design requirements for information regarding individual facility cost limits, room size variations and allowable solutions.

2. STRUCTURAL - SEE SECTION 01010.

3. SPECIFIC PLUMBING DESIGN REQUIREMENTS - UNIT STORAGE RELOCATABLE

There are no specific plumbing requirements for this facility other than the General Plumbing Design Requirements.

4. SPECIFIC HEATING AND VENTILATING REQUIREMENTS - UNIT STORAGE RELOCATABLE

Provide heating with low intensity gas infrared heaters.

Air condition any offices.

Heat building to 40 degrees F. for freeze protection. Include capacity allowance for fresh air quantities in accordance with ASHRAE 62-2001 Ventilation Standards.

Provide exhaust fans. Indoor summer design temperature shall be 10 degrees F above the outdoor design temperature.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS - Unit Storage Facility

Automatic sprinkler protection shall be provided for Unit Storage Facility as follows:

Unit Storage Facility. Provide sprinkler protection per the requirements of UFC 3-600-01. Per UFC 3-600-01, 6-10.1 storage facilities must have complete automatic sprinkler protection. Sprinkler protection must be based on Class IV commodities as defined by NFPA 13. Refer to Fire Protection Design for additional requirements.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers and Cabinets. Fire Extinguishers are required. Refer to Architectural Design for design requirements.

Fire Alarm and Detection System. Fire Alarm and Detection System is required. Refer to Electrical Design for design requirements.

6. UNIT STORAGE INTERIOR ELECTRICAL DESIGN

A minimum of one general-purpose 120 volt, 20-ampere duplex receptacle outlet shall be provided on each wall. It is preferred to have receptacles centered on wall and accessible without having to go into a storage cage when cages are provided.

Interior lighting system shall be low bay pulse-start metal halide or linear T5 or T8 fluorescent luminaires designed specifically for bay or warehouse applications.

The communication system shall consist of a minimum of two simplex jack outlets (voice only).

Photocell controlled wall mounted lighting shall be provided at the entrances to all unit storage buildings

A complete fire alarm system consisting of pull stations, detectors, flow and tamper switches, control panel and fire alarm transmitter shall be provided.

K15 VEHICLE MAINTENANCE

1. ARCHITECTURAL VEHICLE MAINTENANCE FACILITIES

Provide X ea @ 10,500 SF ea. 70-foot wide clearspan structure with no interior columns on 10" thick concrete slab that extends 5 feet beyond exterior wall face on all sides. Personnel door and manual vehicle door 20 feet wide by 12 feet high at each end. Minimum 12'-0" vertical clearance.

Shop Floor (9,200 SF) Seal concrete floor and provide negative pressure exhaust hoses for engine runs.

Tool Room (400 SF) Exterior entry, convenient to vehicle maintenance facilities. Separated from other spaces by wire mesh partitions.

General Item Repair (400 SF) 5 EA prewired workbenches. Separated from other spaces by wire mesh partitions.

Compact Item Repair (400 SF) 5 EA prewired workbenches. Separated from other spaces by wire mesh partitions.

Parts Storage (200 SF) Separated from other spaces by wire mesh partitions.

The Vehicle Maintenance facilities will be built from pre-manufactured components, furnished, and relocatable to meet these functional requirements. These facilities will be clear span sprung structures built from standard components. Creative solutions that minimize delivery time are encouraged. Facility costs include, but are not limited to the structures, components, furniture, equipment, appliances, transport, placement, anchorage, and utility hookup. Infrastructure and site development costs are separate.

Minimum turning radius onto hardstand from the tank trail shall be 30 feet. Minimum tank trail extension width shall be 30 feet. Minimum access drive width from the tank trail onto the hardstand shall be 28 feet. Minimum POV access drive width shall be 25 feet. Minimum POV turning radius shall be 25 feet from 15th Street to the POV access drive.

GENERAL: These requirements are the minimum. Areas indicated are net square feet, and may be exceeded. See Architectural design requirements for information regarding individual facility cost limits, room size variations and allowable solutions.

2. STRUCTURAL - SEE SECTION 01010.

3. SPECIFIC PLUMBING DESIGN REQUIREMENTS - VEHICLE MAINT FACILITY
RELOCATABLE

Interior hose bibb connections shall be provided, one on each end of the shelter. Connection shall be freeze proof with integral vacuum breaker/backflow preventer. Hydrants shall be 3/4 inch hose connections. The piping of the wall hydrants shall be drainable.

Emergency Eyewash/Showers shall be provided at the Vehicle Maintenance Shelter and shall comply with ANSI Z358.1. Waste is to discharge directly to facility floor.

The Vehicle Maintenance Shelter shall be equipped with a compressed air distribution system with the minimum number of compressors indicated below supplied to drops with quick disconnect fittings at appropriate locations in the shelter. Compressed air outlets shall each provide 4 cfm and be spaced every 20 feet along walls of each maintenance shelter. Provide hose reels at each compressed air drop. Mounting brackets shall be provided, for the air drops and the hose reels, to tie them to the nearest column, if the drops do not coincide with the columns. Hose length shall be coordinated with user requirements. A bracket for holding the hose end shall be provided at each hose reel location. Hose reels shall be auto reeling, wall-mounted, completely off the floor, to allow cleaning of particles and dust from the floor beneath the reel. Compressed air shall be supplied at a maximum of 120 psi, minimum of 90 psi at the connections. A minimum of two 50 percent capacity air compressors and two 50 percent capacity air dryers shall be provided. Compressors shall start and stop automatically at upper and lower pressure limits of the system. Air receivers shall be painted carbon steel, ASME pressure vessels, rated for the maximum pressure encountered. All compressed air piping shall be approved copper or Schedule 40 steel. Compressed air quick-disconnect connections shall be 1/4 inch.

A used oil tank, a used antifreeze tank and an off spec(used) fuel tank each of 500 gallon capacity shall be provided at each Vehicle Maintenance Facility. Tanks shall be above ground concrete encased storage tanks, factory fabricated, factory cast, factory tested, and be provided with secondary containment. The entire concrete encased tank assembly shall be UL listed in accordance with UL Subject 2085 Outline of Investigation for Insulated Above Ground Tanks for Flammable and Combustible Liquids. The tank and its location will comply with NFPA 30 Flammable and Combustible Liquids Code.

4. SPECIFIC HEATING AND VENTILATING REQUIREMENTS - VEHICLE MAINT. FACILITY RELOCATABLE

Provide heating with low intensity gas infrared heaters.

Heat building to 55 degrees F. Include capacity allowance for fresh air quantities in accordance with ASHRAE 62-2001 Ventilation Standards.

Provide exhaust fans. Indoor summer design temperature shall be 10 degrees F above the outdoor design temperature.

The Vehicle Maintenance Facility shall be provided with a fan driven hose vehicle exhaust system, which shall attach to exhaust pipe of vehicles to collect their exhaust. The system shall exhaust upward, so as not to injure personnel or damage other buildings or equipment. It shall also exhaust to the outside of the building. The exhaust system should be able to handle the high temperature exhaust from the Abrams Tank, the Bradley Fighting Vehicle, and the Paladin Self Propelled Artillery Vehicle. Flexible exhaust hose shall be 0.012 inch minimum strip thickness of stainless steel. The flexible tubing shall be

connected to the ductwork with a flanged connection. The flanged connection shall consist of steel flanges not less than 0.078 inches thick. The exhaust hose system shall be retractable when not in use; allowing it to be extended to the operating position, when required. The system shall be furnished complete with operating mechanism and all parts necessary for the systems retractability. Four hoses shall be provided at each vehicle maintenance shelter and their locations shall be coordinated with the base.

5. SPECIFIC FIRE PROTECTION REQUIREMENTS - Vehicle Maintenance Facility

Sprinkler System. Automatic sprinkler protection shall be provided for Vehicle Maintenance Facility. See fire Protection Design for design requirements.

Fire Hydrants. Refer to Civil Design for design requirements.

Fire Extinguishers and Cabinets. Fire Extinguishers are required. Refer to Architectural Design for design requirements.

Fire Alarm and Detection System. Fire Alarm and Detection System is required. Refer to Electrical Design for design requirements.

6. VEHICLE MAINTENANCE SHOP INTERIOR ELECTRICAL DESIGN

The design and construction of the vehicle maintenance shops shall comply with the NFPA 70, Article 511: Commercial Garages, Repair and Storage.

Provide a minimum of one quadraplex receptacle along the interior perimeter on either side of each bay and three additional ones shall be placed and evenly spaced along both walls not containing bays. If bay doors are only provided on one side of the shop then quad receptacles shall be placed and evenly spaced along opposite wall with a maximum distance of 20 feet between receptacles. Receptacle outlets in bays shall be mounted 48 inches AFF unless otherwise required by code or criteria.

A completely operational communication system including, but not limited to, one telephone backboard and all necessary raceway, cabling, outlet boxes, terminations, jacks, and stainless steel faceplates shall be provided. No local area network required. All communication outlets shall be simplex jack outlets (voice only). All communications will be terminated on wall mounted telephone backboard.

A Mass Notification System shall be provided.

A fire alarm system consisting of pull stations, heat detectors, control panel and fire alarm transmitter shall be provided

Interior lighting system shall be low bay pulse-start metal halide or linear T5 or T8 fluorescent luminaires designed specifically for bay applications.

Photocell controlled wall mounted metal halide or compact fluorescent lighting shall be provided at building entrances.